FARM CHEMICALS

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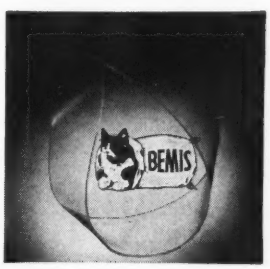
"These extensible bags are the best paper bags we have ever used. As far as I am concerned, we won't use anything else."

"We haven't had a serious complaint since we switched to your 'stretch' bag."

"We broke only two bags in two weeks. We don't want anything else."

Bemis pioneered extensible multiwalls. We have had longer experience with them than any other bag maker. You can profit by that experience. Get in touch with your Bemis Man.



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Lion E-2 bags are easier to handle. They're specially "frictionized" with Monsanto Syton,® a special antislip agent for faster gripping, safer stacking. You can stack Lion E-2 higher without fear of bag damage due to slippage.

Lion E-2 saves your customers time when they need it most. Because Lion E-2 is concentrated, your customers can put up to one-fourth more material in their spreaders. They eliminate at least one out of every five refill stops. Lion E-2 spreads easily, produces the yields that build repeat business for you.

Lion E-2 is going to be seen, heard, and talked about by all of the folks in your county. Unusual advertising (and a lot of it) is going to make your customers "Lion-conscious." They'll recognize Lion E-2 as a dependable product that's guaranteed 33.5% vital nitrogen.

Get set now for the "lion's share" of business. Write LION E-2, Monsanto Chemical Company, St. Louis 66, Mo.

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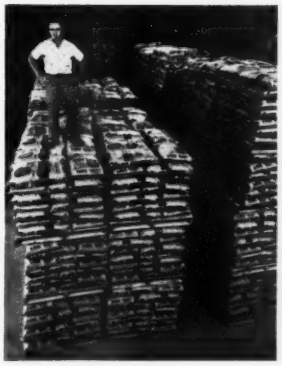
You can stack Lion E-2 higher, safer, faster. The bags are specially "frictionized" with Monsanto Syton, the antislip agent that reduces bag damage due to slippage.



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The national business magazine for the fertilizer and pesticide industries, FARM CHEMICALS, serves primarily those persons responsible for management, marketing and production. It has a qualified circulation for selected executive and supervisory persons within specified segments of these industries, as well as in certain closely allied fields. Subscription rates to all others are: in the U.S., its possessions, Canada, Cuba and Panama: $6.00; in other countries: $7.50. Current issue 50 cents. Back issues $1.00. Established in 1894 as *The American Fertilizer*.

© Ware Bros. Co. 1960

Published monthly by
WARE BROS. COMPANY
317 N. Broad Street
Philadelphia 7, Pa.
Telephone MArket 7-3500

Accepted as Controlled Circulation publication, Philadelphia, Pa.

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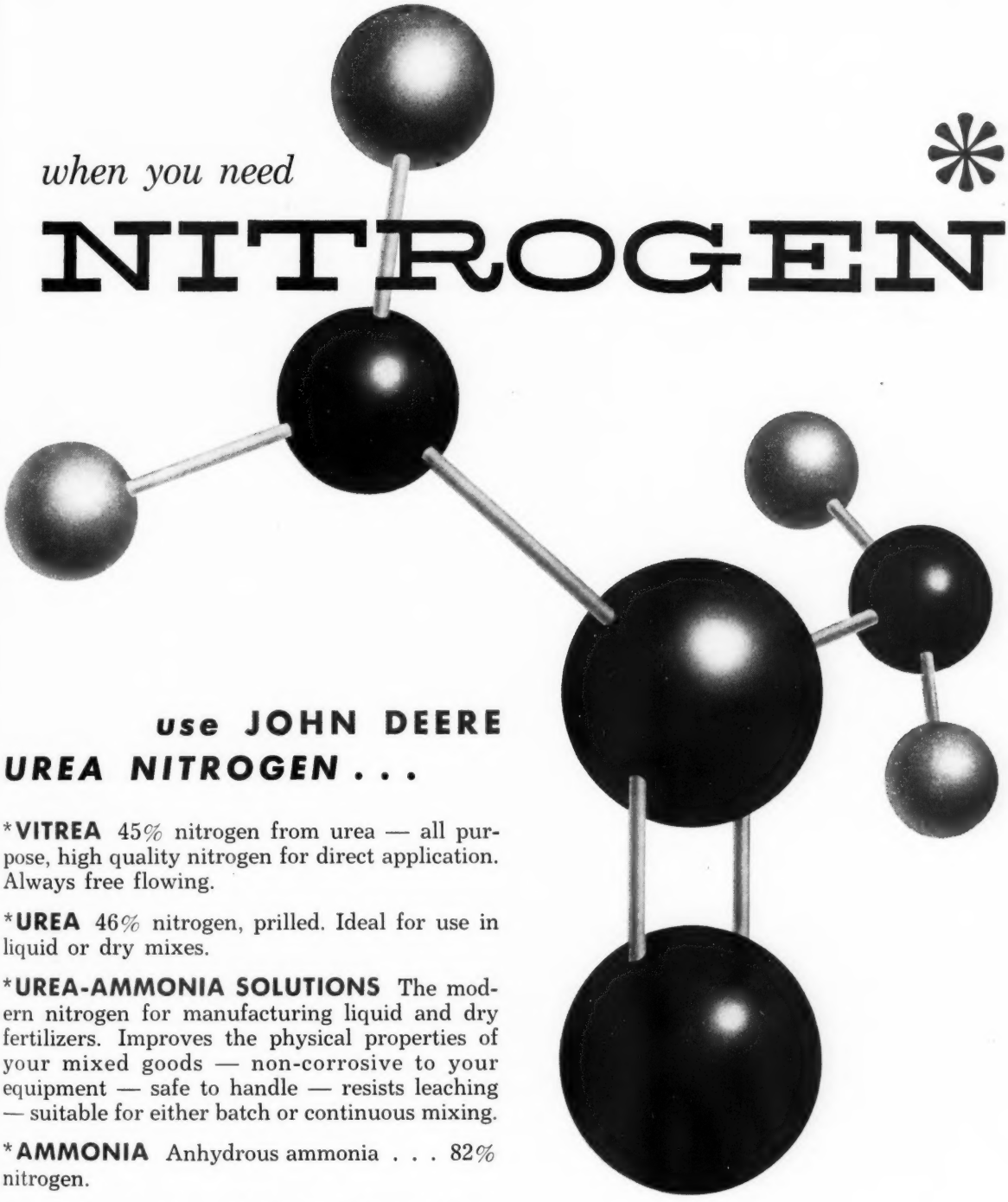
THE COVER PICTURE

Not only do dealers benefit from sales planning—which was mentioned in last month's cover story—but salesmen benefit, too. George Kalteissen—eastern sales manager for Direct Application Materials, Allied Chemicals' Nitrogen Division—shows how he can "top it off" with More Sales, More Profits. How? By sound planning on a solid foundation of corporate functions. FARM CHEMICALS *photo courtesy of Allied Chemical Corp., Vincent Juliano, Photographer.*

when you need

NITROGEN*



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LETTERS

F
C

ODE TO FARM CHEMICALS

Portland, Ore.

The excellence of your January issue has inspired me although not made me any more able to write verse. Your emphasis on marketing is fine and I hope that more western manufacturers will come to know your "new" publication which can now be very valuable to them. Keep up the good work!

R. L. LUCKHARDT
Supervisor, Agric. Technical Service
COLLIER CARBON AND
CHEMICAL CORP.

Consider the Farmer in the Field
He toils now and swims
In the sweat from the noon day sun.
He neither makes the weather
Nor the prices for his crops.

The 60's are said to be his lean years
with less cash for his supplies.
The Isaiah's in their offices
Read the handwriting on their wall charts
Then tell us the happy sales spiral
Has fallen flat upon its 60's.

But as crickets multiply in the fence row
So do his suppliers of ammonia.
With more millions for machinery
to squirt out the plant food
More men will beat his bushes
for the fewer, poorer prospects.

Consider then the Farmer in the Field
Less Credit to his name
More men from whom to buy
He casts his favors where he may
But will he buy from you?

According to FARM CHEMICALS
(Whose issue I've just read)
If your merchandising's modern
In the 60's up ahead
Then you've got a chance of selling
This Farmer in the Field
And continuing your contributions to
Your Social Security.

R. L. LUCKHARDT

Ithaca, N. Y.

I read your magazine with great interest since it contains a considerable amount of news regarding the agricultural chemicals field in which I am interested. In addition I find that your able staff of writers do a creditable job of reporting news of worthy note. Your feature articles inspire one to pause and meditate . . .

Sincerely yours,
M. W. MEADOWS
Research and Development
G.L.F. SOIL BUILDING SERVICE

POTENTIAL ACIDITY

Flat Rock Mich.

I have a copy of your 1958 Dictionary of Plant Foods . . . It is the best book on the subject I have seen but does not answer a couple of questions I have . . .

Your book gives an excellent discussion of potential acidity but does not list a value for monopotassium phosphate and diammonium phosphate. It says these values are additive, proportionately, but I have not been able to check figures on mixtures now on sale with potential acidity figures for the components obtained from another source. Most states do not seem to require this figure and apparently none ever check it.

I would appreciate your comments, including any information on later publications of yours. Would also like to know if you know which states require this test and might run samples for outsiders.

Very truly yours,
J. M. HOFF
HOFF CHEMICAL CORP.

We referred Mr. Hoff's letter to Arnon L. Mehring, author of the Dictionary of Plant Foods. He replied as follows:

The potential acidity of the materials mentioned in your letter is as follows:

100 lbs.	*Equivalent to lbs. of calcium carbonate*
Monopotassium phosphate	*0*
Diammonium phosphate	*113*

You are correct in saying that most states do not require a guarantee of potential acidity. It is my impression that Alabama and North Carolina do on mixed fertilizers. It is not true that none ever check it. When it is stated, the following may check the correctness of the figure: Alabama, Maryland, Massachusetts, New York, North Carolina, Vermont and Virginia. Most states seldom publish potential acidity determinations, but North Carolina always does in its annual analyses bulletins.

No state will run analyses on samples that you send them. All states, however, have roving inspectors that sample all fertilizers found on sale. These samples sent to the state chemical laboratory and the guarantees are checked. Before a fertilizer can be placed on sale it must be registered with the Fertilizer Control Office and a fee paid. The Farm Chemicals Handbook gives the names and addresses of all such offices and a digest of the state laws . . .

APPLYING NEMATOCIDES

Monroe, La.

On page 38 in the December 1959 FARM CHEMICALS is an article entitled "Applying Nematocides" and pictured on the same page is a hand-operated spot injector in which we are interested. Could you please furnish us with the name of the company from whom we could purchase this machine?

Thank you.

Sincerely yours,
NELSON D. ABELL
Owner
OUACHITA FERTILIZER &
CHEMICAL CO.

The injector, known as the Maclean Fumigun, is manufactured by Neal A. Maclean Co., 1536 Industrial Way, Belmont, Calif.—ED.

Richmond, Calif.

Please send us 20 reprints each of the following articles appearing in the January, 1960 issue: "How to Ask for the Order and Get It" by Ted Pollock, and "How to be a Constructive Critic" by Hector Lazo . . .

Very truly yours,
IVOR R. BURDEN
Executive Vice President
UNITED-HECKATHORN

Wyandotte, Mich.

Please send me the following publication which was offered in the December 1959 issue of the U. S. Department of Commerce Distribution Data Guide: 129.108 "How to Figure Sales Potential".

Attached please find 50 cents in coins to cover the cost of the above material . . .

Very truly yours,
J. A. GERBOLYS
J. B. Ford Div.
WYANDOTTE
CHEMICALS CORP.

Shelbyville, Ind.

We recently inquired as to how we could contact Ted Pollock. Your reply was prompt and we certainly thank you.

In regards to his material published in your FARM CHEMICALS magazine, we as a fertilizer manufacturer approve 100 per cent. We approve to the point that we would like 15 reprints of each month's series by Ted Pollock. Please tell us what is necessary for us to do to get these reprints . . .

Yours very truly,
MAX A. HUNGERFORD
GREEN-WAY, INC.

New York, N. Y.

This is to confirm our phone conversation of this morning in which I asked for permission to use FARM CHEMICALS story, "How to Run a Successful Grower Meeting" from the December issue in our publication, "The Crag Line."

Thank you for letting us use this . . .

Very truly yours,
D. R. ACKERSON
Information and Education Manager
Agricultural Chemicals Div.
UNION CARBIDE
CHEMICALS CO.

New York, N. Y.

Please send to my attention, "How to Figure Sales Potential." Thank you.

Very truly yours,
HERBERT BROMBERG
Market Development
COMMERCIAL SOLVENTS CORP.

Cleveland, Ohio

We would appreciate receiving one copy of the following, "When Will Farm Chemicals Come Into Their Own?" Enclosed herewith find 50 cents covering the cost of same.

Yours very truly,
A. E. VANDERWYST
Commercial Development
Dept.
DIAMOND ALKALI CO.

Old Dobbin and the walking plow were indispensable in the early days of cultivating our land.

Engine power has replaced "horse power," making possible bigger farms, better tillage, more economical farming.

FERTILIZER PLANTS HAVE MODERNIZED, TOO

Just as Old Dobbin and the walking plow have given way to modern tractor plowing, so, too, has fertilizer manufacturing been improved. Today, fertilizer manufacturing employs precise, scientific techniques incorporating modern equipment and chemical engineering know-how.

If you have agronomic or fertilizer manufacturing problems, or are looking for new information on improved techniques for more economical production, just call on Texaco for help and suggestions. Our Technical Service people in these fields have a wealth of experience in agronomy and fertilizer manufacturing, both in research and practice.

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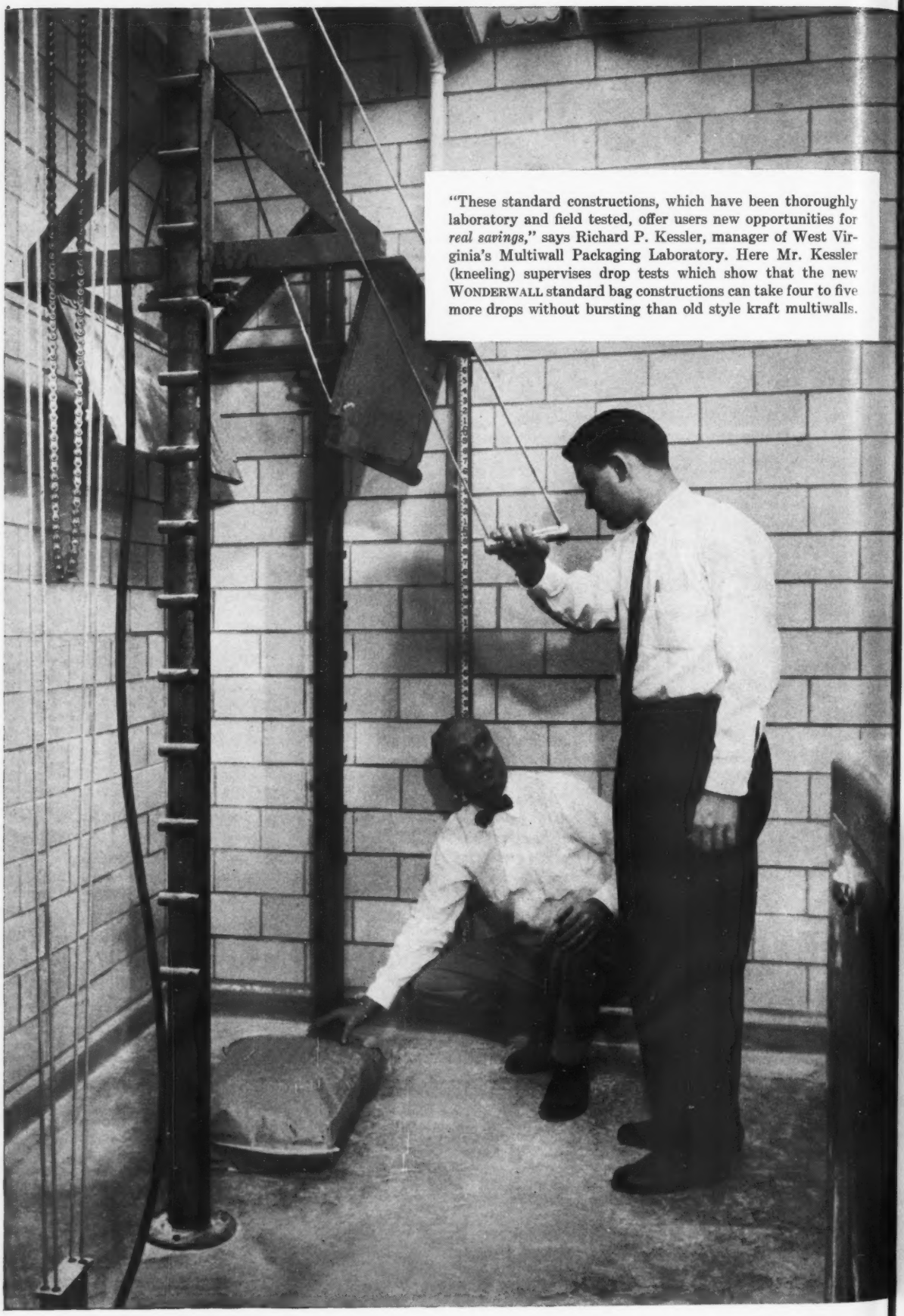


"These standard constructions, which have been thoroughly laboratory and field tested, offer users new opportunities for *real savings*," says Richard P. Kessler, manager of West Virginia's Multiwall Packaging Laboratory. Here Mr. Kessler (kneeling) supervises drop tests which show that the new WONDERWALL standard bag constructions can take four to five more drops without bursting than old style kraft multiwalls.

NEW!

WEST VIRGINIA'S 1960 STANDARD BAG CONSTRUCTIONS TO SAVE YOU MONEY

Major savings for fertilizer packers are being achieved by three new standard WONDERWALL bag constructions perfected by West Virginia.

During a controlled test to determine possible savings in bag costs, various WONDERWALL constructions were developed in our Multiwall Packaging Laboratory. They were tested by 101 packers who shipped 569,224 tons of fertilizer in 12,307,546 WONDERWALLS.

The three recommended standard constructions and their actual savings, as used in normal conditions, are shown in the box.

For example, where a typical 100# old fashioned kraft bag usually would require 1/90 AL, 2/40, 1/50 for a total of *four* plies, the new standard WONDERWALL provides the same or superior strength with *three* plies: 1/100 AL, 1/40, 1/50 . . . at a saving of $3.50 per M.

Secret of WONDERWALL's strength is Kraftsman Clupak*, the paper with the built-in stretch that withstands far more impact without breaking than conventional natural kraft multiwalls. In a WONDERWALL bag, fewer plies are needed to do the job!

See how WONDERWALL standard bag constructions can *cut your costs, increase your profits.* Our technical service experts are ready to help you take full advantage of these new bag developments; call or write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Ave., New York 17, N.Y.

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority.*

West Virginia Pulp and Paper

NEW STANDARD WONDERWALL FERTILIZER BAG CONSTRUCTIONS

Pounds Packed	Old Style Natural Kraft Construction	New Wonderwall	Actual User Savings
100#	1/90AL, 2/40, 1/50	1/100AL, 1/40, 1/50	$3.50/M
80#	1/90AL, 2/40, 1/50	1/100AL, 1/40, 1/50	$3.10/M
50#	1/90AL, 1/40, 1/50	1/100AL, 1/60	$3.80/M

Smith-Douglass Co., Inc., Norfolk, Va., has shipped over 50,000 tons of fertilizer and related products in a million new WONDERWALL 100# standard construction bags. They report excellent results with a saving of $3.50 per M and reduced bag breakage.

WHAT'S DOING IN THE INDUSTRY

F C

IMC ORGANIZES NEW TECHNICAL SERVICE DEPT.

International Minerals & Chemical Corp. has completed organization of a new Technical Service Dept. which the company says will give customer companies "full line" service in every phase of fertilizer manufacturing.

Five technical service representatives have been added to work with customers on the full range of nitrogen-phosphate-potash problems, from plant blueprints through to actual production.

Technical service personnel will operate from the five regional offices of the Agricultural Chemicals Div.

Robert R. Heck, former director of technical service for Southern Nitrogen Co. is assigned to the Shreveport region. Charles E. Franklin, who was manager of technical service for the Fertilizer Div. of Phillips Petroleum Co., is assigned to Indianapolis. William W. Johnson, former technical service representative for Mississippi River Chemical Co. and more recently with Armour Chemical Co., is located in New York.

James M. DeLong, assigned to the Minneapolis region, has been with IMC since 1952, first in research, then as a chemical development engineer at Carlsbad, N. M. H. E. Causey, who will be in the Atlanta region, rejoined IMC in 1957 as technical service representative in the former Potash Div.

J. A. HOWELL DIES

Joseph Adams Howell, former president of Virginia-Carolina Chemical Corp., died Tuesday night, February 16, while on a business trip in Washington, D. C. He was 58.

Howell was head of V-C from 1949 until he was ousted during a stormy proxy fight during the summer of 1956. He had been with the firm for 34 years.

A leader in the consolidation of the American Plant Food Council and National Fertilizer Association, he became first president of the National Plant Food Institute.

For the past several years, Howell has been a consultant in the farm chemicals field.

NEW LAB TO BE BUILT ON CARBIDE RESEARCH FARM

Union Carbide Chemicals Co., Div. of Union Carbide Corp., will build a biological research laboratory on its research farm at Clayton, N. C.

E. E. Fogle, president of the firm, said the laboratory will conduct basic and applied biological research for the agricultural chemicals development program of Union Carbide. Plans call for the building to cover 10,000 square feet, with attached greenhouses providing 2,700 additional square feet of space. It is expected to be ready for occupancy in August.

USDA CLEARS HEPTACHLOR FOR USE ON CORN, COTTON AND OTHER MAJOR CROPS

In a notice issued February 9, 1960, USDA cleared heptachlor insecticide for continued use on corn, cotton, fruit, berries and other important crops.

The newly approved uses result in no residues at harvest time and in compliance with the recently established zero tolerances for heptachlor and heptachlor epoxide.

The USDA announcement included specific label directions for utilizing heptachlor in connection with corn, cotton, lima beans, tomatoes, peppers and small grains. Also cleared at the same time were various berry crops, citrus, cherries, peaches, pears and pineapple.

The chemical also can be used on tobacco, for seed treatment and for protection of turf, recreational areas, roadsides, nursery stocks and ornamentals.

Applications for control of grasshoppers or other insects in pastures and rangeland are approved with the restriction that dairy animals cannot be grazed on treated land and animals being furnished for slaughter cannot be grazed for 90 days following application.

TRUITT BECOMES PRESIDENT OF NPFI; COLEMAN HEADS SULPHUR INSTITUTE

Paul T. Truitt on February 10 was elected president of the National Plant Food Institute, effective March 1, at a meeting of the organization's board of directors at the Edgewater Beach Hotel, Chicago.

Dr. Russell Coleman has been named president of a newly formed international research organization to be known as The Sulphur Institute, according to an announcement Feb. 10. (See page 32 for details.)

Meeting Highlights

NEXT MONTH:

Eighth Annual California Fertilizer Conference

McLane Hall, Fresno State College, Fresno, Calif.

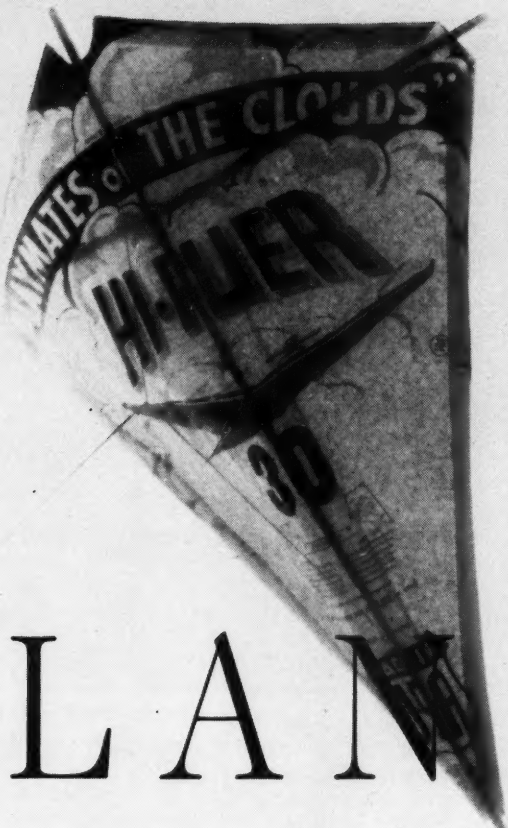
April 11. An outline of the geology and manufacture of phosphate fertilizer materials will be given. Robert Z. Rollins, chief, California Bureau of Chemistry, Sacramento, will discuss industry problems as seen by his office. New phosphate fertilization information will be presented.

During the afternoon, a field tour of fertilizer plots and demonstrations in the vicinity of the campus is scheduled.

In the evening, the annual banquet will be held at the Fresno Hacienda Hotel. Earl Coke, vice president, Bank of America, San Francisco, has been invited to speak on the topic "A Banker Looks at Fertilization for Enhanced Loan Security."

April 12. A panel will discuss "Legume Fertilization", followed by general audience discussion.

The conference is sponsored by the Soil Improvement Committee of the California Fertilizer Association. J. H. Nelson, Nelson Laboratories, and Earl R. Mog, Growers Fertilizer Co., are directing the program subcommittee.



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and giving the kind of individualized customer service that keeps
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BAG PLANTS AND SALES OFFICES COAST TO COAST – A NATIONWIDE STAFF OF BAG SPECIALISTS

WASHINGTON VIEWPOINT

F C

▸ *FDA will get more administrative elbow room to decide fate of farm chemicals.*

▸ *Congress may kill off Soil Bank Conservation Reserve this year.*

▸ *1960 acreage of major fertilizer use crops is expected to top 1959 levels.*

What will Flemming get from Congress this year by way of new laws to prevent harmful chemical residues from coming through in the food supply? With two months of the current session already gone by, there are definite signs of what you can expect—none of it very drastic.

There will be both a tightening and a loosening of current laws—and all according to the plans laid out by the Secretary of Health, Education & Welfare. In essence, Congress will give HEW's Food & Drug Administration more administrative elbow room to decide the fate of agricultural chemicals.

The tightening of current laws would permit FDA to withdraw approval of chemical products which were cleared before the additive amendment was enacted. That is, modification of the "grandfather clause" which permits sales of chemicals with prior approval even though new laws prohibit the approval of new applications for similar products.

The loosening would ease the Delaney cancer amendment to permit the use of pesticides or feed additives which could produce cancer—provided no detectable residues show up in food products. This, of course, would give a clean bill of health to aminotriazole, some chlorinated hydrocarbons, and stilbestrol female hormones for livestock feed—provided they are used properly by farmers.

Farm organizations' efforts to have an official advisory group on chemical additives established have hit pretty much a dead end. No sooner had they made their request to the White House when major consumer newspapers attacked them for pushing an unwarranted special interest. The request, further, was opposed by both Agriculture and Health, Education & Welfare Departments which see no need for still another agency in their respective fields.

But some benefit has resulted from farm organization efforts. The White House has set up a special advisory group composed of USDA and HEW officials to work together. One objective is to assure that such things as the cranberry scare do not recur, another is to act as consultant whenever major actions in the field are taken.

A new wheat program to be effective on the 1961 crop now seems to have the best chance in years—despite, or perhaps, because of—the national election politics this year. If it comes, it is likely to be a temporary stop-gap measure to keep the growing wheat surplus in check until the political atmosphere has settled down and a long-range permanent program can be worked out.

Farm chemicals would feel the impact of a new wheat law. It very likely would mean a dislocation of some pesticide and fertilizer markets in the major wheat-producing areas. It's not too early to take stock of how you might be affected by a change in the wheat law. Here's why:

The inside track is conceded to a bill having these ingredients, although the final version will differ in details: A 20% cut in acres—from the 55 million acre allotment now, to 44 million acres. A slight boost in price supports, at least for the first year. A modified Soil Bank Conservation Reserve to draw productive land into retirement. A payment-in-kind program, by which the government would pay farmers in government wheat for what they could have grown on retired acres. A reduction in the 15-acre exemption from controls down to 12 acres.

Involved in such a program is a half billion in farming spending power. This stems from the loss in farm sales of about 250 million bushels resulting from taking 11 million acres out of production. It means that some of this money would *not* be spent for wheat production expenses, including chemicals. While farmers who remain in production will push for higher yields, the increased demand for chemicals by them would not be enough to offset the withdrawal of 11 million acres out of production. Area of greatest impact would be the Plains States from the Canadian border to Mexico.

The Soil Bank Conservation Reserve is teetering on the edge of disaster. Congress may kill it off this year, although its supporters are putting up a desperate fight to expand it. President Eisenhower suggested expansion from 28 million acres this year to 60 million. But powerful men in Congress from both parties oppose expansion. They charge adverse effects on some rural economies, poor USDA administration, and abuses. Also, Democrats want to avoid letting the Administration take credit for increased benefits during this election year.

If it were expanded to the Eisenhower level, it would mean 13% of cropland out of production. Economists say it would take about that much of a land-use reduction to make a dent in surplus production. As in the wheat acre reduction, this expanded

New H-30 PAYLOADER®

a completely new unit with four-wheel drive

This tractor-shovel is the smallest "PAYLOADER" ever built with 4-wheel drive. In spite of its compact size and modest price, it has the latest improved features and refinements of larger "PAYLOADER" units, and many performance advantages not found in any other machine.

Four-Wheel Brakes: Powerful hydraulic type, and sealed to keep out dust and dirt.

Full Power-Shift Transmission plus torque-converter: Three speed ranges in each direction. All shifts in either direction can be made "on-the-go" with a flick of the fingers — no foot clutching.

Operator Visibility and Safety: New slope-down front end lets operator see bucket-loading action. All moving members are removed from operator's contact. He gets on and off safely with a fixed ladder and hand rails.

Closed Pressure-controlled Hydraulic System: Oil reservoir is closed and pressurized to exclude airborne dirt and dust — includes a cartridge type oil filter and fine-mesh strainer.

Positive Oil Cooling: Separate fan-cooled oil-to-air radiator assures positive cooling of transmission and torque-converter oil.

Maximum Accessibility: Fuel tank and transmission can be checked and filled from ground level. Easy access to battery, engine and other necessary points.

Your Hough Distributor is ready to give you data on this H-30 or any of the other "PAYLOADER" sizes from 2,000 to 12,000 lb. operating capacity. There's a model to meet your bulk material handling needs, indoors or outdoors. He also has complete service and parts facilities, backed by factory service personnel, to keep your "PAYLOADER" investment profitable.

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

77½ H.P. — 1 cu. yd. bucket . . . 3,000 lb. operating capacity

more power, more reach and more dumping height than any comparable machine

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
704 Sunnyside Ave., Libertyville, Ill.

——— Send data on new H-30 "PAYLOADER"
——— Send data on other models and attachments

Name _____
Title _____
Company _____
Street _____
City _____ State _____

3-B-3

What's Coming Next Month

This month and from now until the last Burpee seed catalog is distributed, more than the usual amount of huffing and puffing by the nation's postmasters will be in evidence. An advertising executive for a specialty manufacturer told FC that a quarter of a million copies of just *one* promotional piece probably will not take care of the demand. He expects a quick re-printing. Multiply this number by . . . you name the number of products! . . . and you can visualize the frenzy that will be whipped up along the RFD routes come the first thaw.

■ WEATHER—LAST FRONTIER

The scene we tried to portray of the hustle and bustle of rural post offices is good for the next bit of business—*weather business*. On this subject, every farmer is an expert, but few ever make out very well. It is said "that the most successful farmer has been the one that has the best understanding of the 'calculated risk'." Weather remains the biggest risk without control. "The only way to deal with unfavorable weather is to anticipate and avoid it," says the author of our "Weather for Agriculture" article last month by Agricultural Meteorologist John A. Riley, U. S. Weather Bureau Agricultural Service, Stoneville, Miss. Next month, FARM CHEMICALS initiates its exclusive feature which will explain how to anticipate and avoid unfavorable weather for certain operations like planting, fertilizing, dusting, spraying . . . and selling.

■ LIQUID FERTILIZERS

In keeping with the advances made in the liquid fertilizer industry by modern technology, production of liquid forms has made rapid strides east of the Rockies, from one plant in 1954 to 256 plants at the present time. FARM CHEMICALS brings you through one of the earliest of these and shows how a liquid fertilizer company successfully modified its operation which resulted in reduction in costs and the benefits derived thereof.

. . . in the new

FARM CHEMICALS BPA

WASHINGTON VIEWPOINT

program also would have an impact on chemical and fertilizer sales. It would amount to a basic re-alignment of current farm production patterns over the next few years.

The CR has been over-rated as a surplus crop-reduction program, but seriously under-rated in other areas. So far, it has taken out only marginal land from which little production comes—compared to an expansion which undoubtedly would bring in higher-producing land. In other areas, it has helped widows, oldsters and others to "invest" their land for pay, helped marginal farmers "bank" farms and find off-farm employment, and has sparked a big tree-planting boom in the Southeast and contributed toward putting about 8 million "dust bowl" acres under grass.

1960 acreage of major fertilizer-use crops is expected to increase over 1959 levels. Unofficial reports to the Agriculture Department say that corn, cotton and soybean acreage will probably be up. If so, and weather cooperates, total 1960 production is likely to exceed 1958 record which was matched in 1959.

Price supports for most 1960 crops are being continued at 1959 levels. Of the major crops, only corn, wheat, and cotton will have somewhat lower rates this year. The cotton rate, announced last fall, is down about 1¢ a pound. Corn support for 1960 went down from $1.12 a bushel in 1959 to $1.06. Wheat drops from $1.81 to $1.77 per bushel. All other field crop supports stay at 1959 levels, with the exception of peanuts which have been increased slightly from $193.50 per ton.

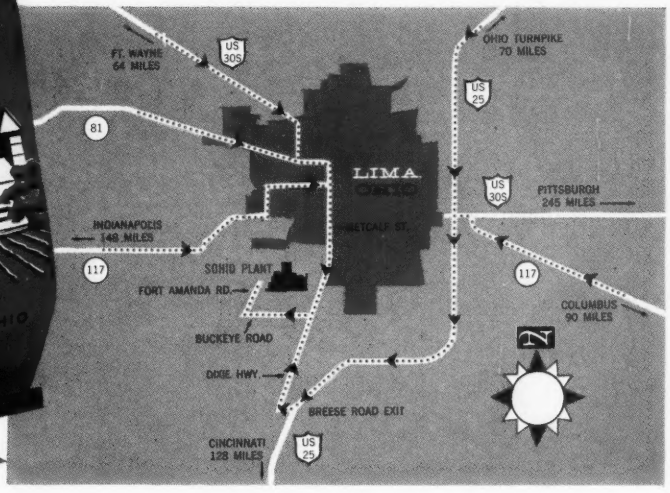
Reason other field crop supports were held steady is the increase of 12 million acres into corn last year. USDA believes the price relationships between corn and other grains was unbalanced in favor of corn. To obtain the "proper" relationship between competing crops, corn support was reduced but the others were held steady. They are: soybeans, $1.85 a bushel; oats, 50¢ bu.; rye, 90c bu.; barley, 77c bu.; grain sorghum, $1.52 per cwt.; flaxseed, $2.38 bu.; cottonseed, $38 per ton; and dry edible beans, $5.35 cwt.

Key men in farm legislation this year are Vice President Nixon and Senate Majority Leader Lyndon Johnson—both presidential hopefuls. As President of the Senate, Nixon's influence and vote on farm matters is crucial. Normally, he doesn't have to vote unless a tie vote comes up. If this happens, and Democrats will try to set one up, Nixon will have to go along with the Benson program or with the Democrats—a choice he may not care to make at the time. Nixon is reported as not favoring continuation of the Benson line.

Johnson has the power to decide whether there will be major legislation on agriculture this year, and if so what kind. The bill he pushes will be regarded as his farm plank, if he should capture the nomination this summer. On the other hand, if there is no farm bill, he will get much of the blame—his leadership position is that strong.

SOHIGRO UREA

rounds out your line . . . and we map the way to do it!



Lima is the hub of Ohio's major highways and 5 leading rail lines — a big advantage when you want Sohigro Urea fast — via direct delivery or plant pickup.

Handy! That's the Sohio plant at Lima, Ohio. It's your convenient source of Sohigro Urea to make your fertilizer line really complete this year. Handy for us to serve you by rail or truck . . . also *your easy-to-reach location* for plant pickup.

Fact, not fad! That's the story on supplementary nitrogen. There's a big and booming demand for extra nitrogen over and above what even high-nitrogen mixed fertilizers can furnish.

Extra dollar volume! It's yours . . . the easy way . . . with Sohigro Urea. Built-in farmer acceptance. Solid sales features: Prilled, free-flowing, easy to apply. Delivers 45% actual nitrogen . . . more than any other solid nitrogen fertilizer. Fast-acting, but long-lasting.

Fill out your fertilizer line for 1960 with Sohigro Urea. Use the map to route your trucks into Lima. Write for extra maps to supply each of your customers with the right route. And ask your "Man from Sohio" about the extra profits you can make by adding Sohigro Urea to your fertilizer materials.

See Sohio first for high-quality 45% or uncoated 46% urea — anhydrous ammonia — aqua ammonia — 18 nitrogen solutions, including all urea types.

. . . we're serious about SERVICE at Sohio

SOHIO CHEMICAL COMPANY

FORT AMANDA RD., P.O. BOX 628 • LIMA, OHIO

Phone CApitol 5-8015 or wire (TWX call letters LIMA O 497-U)

8-60

PRODUCTS AND SERVICES FROM IMC

- Phosphate Rock
- Triple Superphosphate (Coarse, Granular, Run-of-pile)
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- Muriate of Potash (Coarse, Standard, Granular)
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- Sul-Po-Mag®

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Customer Service
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INTERNATIONAL'S FULL ORBIT SERVICE

IMC's Man with a Sales Mission applies product and assistance to all phases of his customer's fertilizer business.

Because of today's critical need for improved fertilizers and methods, IMC concentrates on rigidly controlled product quality and market penetrating assistance . . . it makes your IMC representative a . . .

MAN WITH A SALES MISSION

His mission: superior fertilizer ingredients that help you move more finished goods to the farm . . . your total success with his products and services.

He handles a full line of fertilizer ingredients — each carefully controlled through every step of production — recovery, blending, drying, grinding, and loading. These are products of superior specifications to meet today's growing preference for multiple sources of nitrogen, potash and phosphorus within a single formula.

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Phosphate Rock — Run-of-mine or ground to your own exacting specifications. IMC conducts 57 sample tests an hour for grade uniformity. Result: ideal acidulation. Vast resources give you the grade and tonnage you want when you want it.

Triple Superphosphate — ROP, coarse or granular. Guaranteed 46% APA. Extra-long reaction time and natural curing promote physical and chemical characteristics that make handling and storing easy. IMC Triple Superphosphate is of uniformly high analysis, gives fewer reversion problems.

Phosphoric Acid — cuts corners on formulation costs, keeps high grades on the low side of cost control. Wet process, 53-55% P_2O_5. Delivered in rubber-lined tank cars — rush season, any season.

Muriate of Potash — coarse, standard, granular. Minimum guarantee 60% K_2O; typical analysis 61%. For mixed fertilizers, direct application or pelletized mixed goods. IMC has the resources to help you formulate with specific grades, meet production schedules every time.

Sulphate of Potash — less than 2½% chlorine, acid free. Minimum guarantee 50% K_2O; typical analysis 51.7% K_2O.

Sul-Po-Mag® — Sulphate of potash-magnesia, water soluble, fast acting, low chlorine content. Minimum guarantee 18% MgO, 21% K_2O; typical analysis 18.8% MgO, 22.6% K_2O. Now recognized as a major fertilizer ingredient, also used for direct application.

Above all, he makes consistency of product quality within his full line his first obligation. His mission is your success. Just give him a call.

Products for Growth* IMC

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AGRICULTURAL CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Administrative Center: Skokie, Illinois

18-60

A full line of quality-controlled products meets the needs of individual formulas and processes — handling, mixing, storing.

IMC's Man with a Sales Mission isn't finished until his customer's product is on the farm — in greater volume.

TURNING COMPLAINTS INTO EXTRA SALES

Changing gripes into sales is an art that salesmen can master. Some of the techniques appear in this eleventh in FARM CHEMICALS series of articles on "Successful Selling".

By TED POLLOCK

EVERY salesman must expect to run into some complaints. And, depending on his ability to handle them, they can be shattering, frustrating, costly experiences—or positively priceless opportunities to sew up a customer's allegiance and business.

They can take any of a hundred forms: "This bill is outrageous." "Your service is terrible." "Deliveries are late." "The last one I bought broke down." "Your company doesn't keep its promises."

Which they shall be, say the men who have learned to turn them to advantage, is largely determined by four factors—the salesman's

- Attitude and approach.
- Capacity for "discovering the villain."
- Ability to find solutions.
- Knack for cashing in on complaints.

In that order.

ATTITUDE AND APPROACH

"The real McCoy salesman sees a complaint for what it really is," says a district sales manager for a farm chemicals manufacturer, "—a chance to be of service to a customer when that service is most wanted, a golden opportunity to prove to a buyer that his problem is the salesman's problem.

"But you can't expect a customer to believe you care unless you show him that you do. This means, first of all, *taking the complaint seriously.*

"Whether your customer thinks you're giving him the evil eye or grumbles about defective merchandise is immaterial. The point is, as far as he's concerned, he has a legitimate beef. Minimize it in any way and you immediately compound his grievance because you are, in effect, challenging his judgment.

"Besides, a man with a gripe is in no mood to be reasonable. Not at first, anyway, Above all, he craves an audience, someone to whom he can pour out his tale of woe. Therefore, the smart salesman makes it a point, at the first hint of trouble, to *get to his customer.*

"If it isn't possible to put in a personal appearance, call him up. But 'get there.' It's the very best way to show a man how highly you value his business.

"Once there, *listen.* Look interested. Display concern. Get all the facts. Don't speak until you're certain that he has nothing more to say. A talked-out customer is the easiest to deal with.

"Then *summarize,* in your own words, his net valid complaint. This serves two purposes: it disarms the complainer by showing him how closely you have followed what he's been saying. And it helps you keep his points straight in your own mind."

Adds a salesman for a fuel distributor: "Next to

letting off steam, what the disgruntled customer wants most is satisfaction. If his complaint is justified, be quick to admit it—but be sure to explain *why* things went wrong and *why* a recurrence is all but impossible. Otherwise, your assurance that 'It won't happen again' may sound like a hollow promise."

The sales training director of a paper products company has found the phrase, "Now that we know," followed by a specific remedy for the complaint, a most valuable good-will winner.

In his own words: "A customer who raises Cain frequently feels a little sheepish after wading into a salesman. "Now that we know' helps him save face. It's a way of thanking him for pointing out an error or shortcoming. At the same time, it's a promise—that any future complaints will receive the same prompt attention. For a short phrase, it does a "whale of a job."

Summing up, David Colen, president, Fotomart Inc., photographic supplies wholesalers, advises: "Welcome complaints as voluntary tip-offs to what you can do to cement relations with your customers. It's the man with the silently nursed dissatisfaction who should worry you, for you'll never know how you can be of maximum service to him. The most skillful doctor in the world can't treat a patient who refuses to say where it hurts."

"DISCOVERING THE VILLAIN"

According to Walter Hardy, vice-president in charge of sales, Radio Division, North American Philips Co., the biggest mistake a salesman can make in handling a complaint is to pin the blame on "someone in the front office."

"Avoid that approach like the plague!" he warns. "Passing the buck can only arouse suspicion, as if the salesman were saying, 'It's not my fault, but I'll help you anyway.' Rather than dig up excuses, ask your customer, 'What happened?' That way, you boil the whole issue down to *what* went wrong rather than *who* is to blame. You ally yourself with him in a search for the common enemy—the cause of his complaint. When you find it, get rid of it."

Sometimes, the grievance is based on error. When that's the case, a calm review of the circumstances may divulge the culprit.

The chief adjuster for a large metropolitan department store cites the lady who bought several copper-bottomed cooking utensils, only to call back in a few days with fire in her eyes.

"She complained that the copper had 'burned off' after a few days' cooking," he recalls. "When we asked her whether she had tried polishing the utensils, it turned out that the salesman who originally sold them to her neglected to explain how to care for them. When we showed her how, she was satisfied—and bought some polish to boot. Of course, if the salesman had done his job properly in the first place, that complaint would never have been filed. But a little detective work uncovered the reason—and suggested the remedy—for it."

While all complaints are not so easily settled, many do fall under certain broad categories. Next time you find yourself facing a complaint, consider these possibilities. They *could* save you from a lot of sound and fury.

▶ **Improper use of product or service.** Even the simplest gadget in the world that is used incorrectly won't operate effectively or measure up to the claims of the manufacturer. The soap recommended by a washing machine manufacturer, for example, will obviously do a better job of washing clothes in *his* machine than the soap that the customer chooses indiscriminately. The advertisement written for a trade audience won't have the same kind of impact on the consumer public. The truck built to carry a 10-ton load may well buckle under a 15-ton burden.

Check on your customer's handling of your product or service. The villain could be simple misuse.

▶ **Improper diagnosis.** A buyer complains about a machine's sputtering performance. The salesman investigates and finds—faulty wiring. An irate customer descends on a retailer because of spotty reception on his new TV set. The culprit? A diathermy machine in a nearby hospital.

Sometimes, an outside factor, one you have nothing to do with, is the cause of the complaint. Find it if you can—and make a friend.

▶ **Misunderstanding.** Many complaints are based on lack of information. The man who doesn't get a discount because he pays in six weeks instead of 30 days . . . the customer whose policy has lapsed . . . the buyer who misreads your guarantee—each bases his complaint on a different frame of reference from you.

Such "emotional static" can lead to a verbal free-for-all. A few well-placed questions and some patient answers can clear the air.

But suppose the customer's complaint is justified? What then?

FINDING SOLUTIONS

The main reason for investigating a complaint is to undo some kind of damage—to profits, products or peace of mind.

Easier said than done?

Of course! But well within the salesman's power—providing he learns how to find solutions that are mutually acceptable to his customer and company.

The first step toward finding such solutions is to familiarize yourself with your company's facilities and adjustment policies. Precisely what guarantees does it offer? Who is responsible for deliveries . . . maintenance . . . billing? How soon can parts be replaced? What departments are especially geared to help customers with offbeat problems? Where is your nearest warehouse? How far does your own authority to make adjustments extend?

The answers to such questions will automatically set limits to the kind of redress you can offer your customers—but the result will be *proposals that you know you can live up to.*

Once you know what you can do for your customer, tell him—precisely, concretely, honestly. If you cannot give him an immediate answer, tell him you will take it up with your firm and give him the answer within a few days. Whenever possible, give him just

WHEN YOU MUST SAY "NO"

Not every complaint can be adjusted to the customer's complete satisfaction. When he wants more than you can give him, try this four-step approach:

- Explain why you cannot do what he asks.
- If possible, draw a parallel with his own line of business.
- Be firm but pleasant.
- Hammer away at the benefits of your product or service.

a little more than he expects or demands by way of allowance or replacement.

For example, if your customer's demands are unfair —but not costly—make no charge for repairs or service. If his complaint is filed three days after the expiration of a 90-day guarantee, honor it—if you can. In short, don't win the argument and lose the customer.

The second step toward finding mutually acceptable solutions is to ask your customer, after telling him what you will do to rectify the error, "Is that acceptable to you?" Encourage his comments on the justice of your plan, for such encouragement pays a double dividend. It indicates your confidence in the fairness of the proposal and it proves that your only interest is his total satisfaction.

"If you, your company or merchandise are at fault, settle the complaint on the spot," says a retail specialist for a large appliance manufacturer. "People are generally reasonable. What they want—and have a right to expect—is fair play. Erase the *cause* of a complaint and, in 9 cases out of 10, you will hear no more about it. But it's a good idea to take the initiative later and check back on the situation."

CASHING IN ON COMPLAINTS

It is one thing to "take care" of a complaint, quite another to turn it into what every salesman craves—extra sales.

Yet, it's done every day, in a wide variety of ways. Here are the most important ones.

1) Self-improvement. In those cases where the salesman is personally at fault, a complaint can be a blessing in disguise. For example, if investigation shows that product performance is poor because the salesman neglected to explain its operation clearly, he can take steps to sharpen future demonstrations. If the difficulty centers about lack of service, he can reassess—and improve—his current methods of keeping in touch with customers. Even if a personality quirk is alienating customers, he can work on eliminating the cause of the friction.

The important thing is to learn to look on every form of criticism—spelled out or implied—as a springboard to better performance.

2) Company feed-back. "I get some of my best ideas from complaints," reports an office furniture salesman. "For instance, a customer once lodged a protest with me over the construction of our desks—the way they were built, a lot of unsightly wires hung over one side. I wrote up the complaint and passed it along to our production people. The result was the addition of interior conduits that kept telephone and other wires out of the way. That feature turned into one of my most potent selling points." If your customer's gripe is legitimate, examine the possibilities of eliminating its cause by bringing it to the attention of your company. Anything you can do to improve your firm's product or service is bound to improve your over-all sales.

3) Your other customers. Some time ago, the Electrolux Corporation received several complaints about the malfunctioning of a certain part of a new vacuum cleaner. Tests indicated that there *was* something wrong with it. Rather than hope for the best and attending to complaints as they came in, the company replaced the part on some 50,000 machines already in use. The result: 50,000 customers mightily impressed by Electrolux's desire to keep them happy.

The moral? Customer A's complaint could be an anticipation of customer B's, C's and D's. After attending to A, why not hurry over to the others and show yourself off as a *voluntary* trouble-shooter? Neat. Impressive.

4) When you're innocent. Here's a chance to win the gratitude of your toughest customer. Even if his problem has nothing to do with your product or service—*help him solve it.* There is no better way to clinch a business relationship than to prove yourself a friend in need.

Have another customer who solved the dilemma? Find out how he did it—and pass along the information. Can any of your company's experts come to the rescue of a customer? Get their help. Know how your customer can reduce his inventory . . . save money . . . be more efficient? Tell him.

The salesman who snaps into action when his customer bellows loud and clear is not one-tenth as rare as the one who takes his cue from a casually mentioned problem.

5) Complaints about the competition. Not all the gripes you hear will refer to *your* product. Some at least will be leveled at your competitors. Take them for what they're worth—million-dollar tips that can be put to work for you. Not for knocking the competition—but as a clue to how you can make your product more desirable than ever to customers and prospects.

6) Future reference. Once you have a disgruntled customer, you also have his pet peeve out in the open. You know precisely what irks him most. What a bonanza! From that moment on, you can see to it that the circumstances that brought on his complaint are never allowed to build up again. Given enough complaints, a dedicated salesman ought to be able to turn himself into the perfect salesman—so sensitive to his customers' needs and requirements that he knows them before they do.

A tall order? Sure.

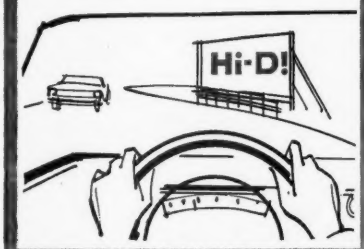
But even an oyster is irritated before it turns out a pearl. ▲

THERE ARE 6 SOUND WAYS TO SELL IN '60

AND THE Hi-D® PROGRAM'S GOT THEM ALL!

OUTDOOR

Billboards in 879 locations spread across 13 top-market states in the South and Midwest.

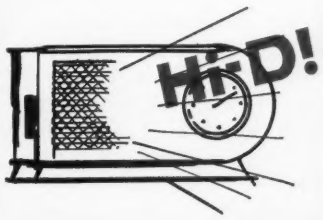


TELEVISION

A 10-state campaign for a solid 13 weeks emanating from 18 TV stations.

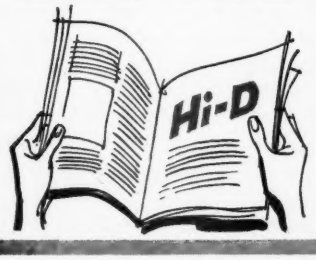
RADIO

A 13-week advertising program that saturates 17 states from 75 radio stations.



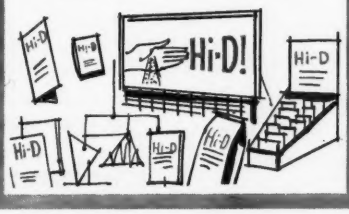
MAGAZINES

Full-page, four-color advertisements appear in "Progressive Farmer" . . "Farm Journal" . . . "Successful Farming" . . . and "Farm & Ranch."



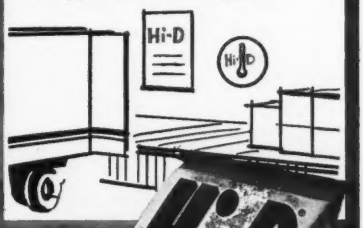
INSIDE THE STORE

Attention-getting point-of-sale material for in-store promotion. Includes Hi-D mobile . . . soil sample bags . . . counter display with Hi-D samples . . . wall banners . . . consumer folders . . . matches . . . and technical data service.



OUTSIDE THE STORE

Two brand-new items designed for posting outside your store or warehouse: attractive Hi-D metal sign and large clock-style thermometer identify your store as Hi-D headquarters.



Hi-D keeps your sales on the grow in '60!

CSC

COMMERCIAL SOLVENTS CORPORATION Offices in Atlanta, Chicago, Cincinnati, Cleveland, Detroit, Kansas City, New Orleans, New York, St. Louis, Sterlington, La.

What is a FAIR price?

By ERWIN H. KLAUS*

CONSIDERING the noises one hears about the presumed evil of administered prices, some Congressional committee is likely to stick its collective nose into this situation. For the committee's sake I hope it won't select the fertilizer industry as a target, for it would have little choice other than to beat a hasty retreat in utter frustration. That might help the tranquilizer industry and, come to think of it, the fertilizer industry as well, for it would certainly come out of it shining with the glistening innocence of a newborn baby, unless you want to classify price cutting as administering prices. Anyway, that isn't what's meant by "administered prices," and so the industry can fearlessly plead *not guilty*.

However, it can hardly be said that its fearlessness extends to asking a fair price for a product that is a proven profit maker for its user. What schizophrenic thought processes keep so many fertilizer manufacturers from straightforwardly and persuasively telling the beautiful benefit story they can tell, and from putting a price on the benefit that compares with the value received by the customer, escapes me.

A FAIR PRICE FOR SELLER AND BUYER

What is a fair price? If I may be permitted to quote myself, I shall quote the *definition of a fair price* from the "How to Put Muscle in Your Marketing" article I wrote for this magazine about a year ago.

"To the seller a fair price is one which permits him to recover his costs, plus an equitable profit, when using competitive facilities. If his profit doesn't permit him to reinvest in research and product development and in the marketing of the product to create acceptance for it, he cannot continue to deliver product benefits to the buyer.

"To the buyer a fair price means getting a benefit that he can recognize, with the promise that at some future time he will get an even greater benefit because the seller has reinvested part of his profit to produce that still greater benefit. A fair price should also mean freedom from discrimination. The buyer should be able to buy at the same price under the same terms as every other buyer under like conditions—with special privilege for none."

The fact that this principle is being violated and is therefore considered controversial by the violaters does not change its economic soundness. Nor does the violation produce a benefit for anyone. Quite to the contrary, nobody gains when the seller does not get his fair price and thereby does not make a fair profit.

A FAIR PROFIT

But the matter goes deeper than being an issue of *price* alone. Pricing is part and of course a very important part of the distributive process. To make the distributive process function smoothly and effectively requires competent management. We are now living in the second generation of one of the greatest revolutions that ever happened. It is the managerial revolution, which took over when the concepts and practices created by the industrial revolution no longer got the job done well enough. In its turn the managerial revolution created new concepts. Overriding all others is the concept of a new kind of capitalism that is based on the idea of a fair profit for free business enterprise with enlightened service to customers as well as to the community as a whole.

There is nothing soft about the *fair profit* idea. It demands from a business to be the kind of strong enterpriser who will strive hard to maintain price structures in order to recapture costs and preserve profit margins. One recourse under the *new normalcy of high fixed costs* is to get more from the labor of the people in a business. Secretary of Labor James P. Mitchell explained it very well when in a recent talk in Minneapolis he challenged his audience of manufacturers to increase their effort to make the most of the skills currently within the possession of their employees. "Maximum efficiency from any work force," he said, "is dependent upon the climate in which expression of ideas is *encouraged and recognized*."

A HOTBED OF INERTIA

This climate is another concept produced by the managerial revolution. But it appears as though this revolution has bypassed the fertilizer industry. And what is the relation of this to price? Simply this.

When you need to recover higher costs, you must increase the productivity of your people. Nowadays you don't do this through old-fashioned slave-driving, but through *spirited leadership which inspires* the people in your business to *want* to do a better job, to *want* to make yesterday's excellence today's commonplace, to *want* to sell the product at a price which the company has determined it must get in order to make the fair profit to which it is entitled. As I have discussed in different relationships in previous articles,

*Ernest L. Loen & Associates, Management Consultants.

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Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK, as part of your next bag order. See the difference for yourself. Your customers are sure to like the extra service of a better, more dependable bag . . . and so will you.

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the fertilizer industry has been lacking such leadership. It has been operating from a *hotbed of inertia.*

WHEN YOU CUT PRICES . . . . THIS HAPPENS

For what element of enterprise, what business acumen lies in cutting prices when you can ill afford to do so? There are several ways of illustrating the consequences. Here is one way. Can you sell more fertilizer when you cut your price? How much more? How much would you have to sell? Take a look at the table on page 24. By a quick calculation of this formula you can figure out that when your gross margin is 20 per cent, and you cut your price 10 per cent (which may not seem like very much), you would have to increase sales by 100 per cent in order to make the same dollar gross margin.

How the formula works:

The formula is $\frac{C \times 100}{M - C} = X$. X is the higher volume to sell amount you want to determine. M is your gross margin. Same is 20 per cent. You cut the price by 10 per cent. You subtract 10 from 20, which gives you 10. 10 into 10 times 100 or 1,000 is 100. Assuming you are working on a gross margin of 30 per cent or of even 40 per cent. By applying the formula you can quickly determine that, if you cut the price 10 per cent, you would still have to increase sales by 50 per cent or 33.3 per cent respectively.

This isn't the whole story, of course, as it will affect your net profit as well. If you don't move enough volume to cover your loss, it will of course cut into your net or even dip your balance sheet into the red. Even if you would recover your loss through a sufficient increase in volume, you still won't have made up all of the difference as handling the increased volume adds to your total overhead. Thus, in order to gain the same net you would have had if you had not cut your price,you would actually have to sell even more than the formula figures show.

"But we have no choice other than to lower prices," the top executive of a fertilizer manufacturer told me. "The farmers are simply waiting until they find out where they can buy it cheaper, and there is always someone who will beat just about any price." And so he settled back on his hotbed of inertia.

THE FARMER DOESN'T GAIN

Of course, by now many farmers, in fact far too many, have become accustomed to buying on price rather than on the basis of benefits to be obtained. Most fertilizer sellers, be they dealers, distributors

(*Continued on page 38*)

HERE'S HOW MUCH YOU WILL HAVE TO INCREASE VOLUME TO GET THE SAME GROSS MARGIN

When You Cut Your Selling Price	Decide your per cent of price cut—then to find the percentage of unit sales increase you'll need in order to yield your present number of gross margin dollars, look up the column beneath your present percentage of gross margin to sales.							
	15%	20%	25%	30%	35%	40%	45%	50%
5%	50.0	33.3	25.0	20.0	16.7	14.3	12.5	11.1
6	66.7	42.9	31.6	25.0	20.7	17.6	15.4	13.6
7	87.5	53.8	38.9	30.4	25.0	21.2	18.4	16.3
8	114.3	66.7	47.1	36.4	29.6	25.0	21.6	19.0
9	150.0	81.8	56.3	42.9	34.6	29.0	25.0	22.0
10	200.0	100.0	66.7	50.0	40.0	33.3	28.6	25.0
11	275.0	122.2	78.6	57.9	45.8	37.9	32.4	28.2
12	400.0	150.0	92.3	66.7	52.2	42.9	36.4	31.6
13	650.0	185.7	108.3	76.5	59.1	48.1	40.6	35.1
14	1,400.0	233.3	127.3	87.5	66.7	53.8	45.2	38.9
15	—	300.0	150.0	100.0	75.0	60.0	50.0	42.9
16	—	400.0	177.8	114.3	84.2	66.7	55.2	47.1
17	—	566.7	212.5	130.8	94.4	73.9	60.7	51.5
18	—	900.0	257.1	150.0	105.9	81.8	66.7	56.3
19	—	1,900.0	316.7	172.7	118.8	90.5	73.1	61.3
20	—	—	400.0	200.0	133.3	100.0	80.0	66.7
21	—	—	525.0	233.3	150.0	110.5	87.5	72.4
22	—	—	733.3	275.0	169.2	122.2	95.7	78.6
23	—	—	1,115.0	328.6	191.7	135.3	104.5	85.2
24	—	—	2,400.0	400.0	218.2	150.0	114.3	92.3
25	—	—	—	500.0	250.0	166.7	125.0	100.0

VELSICOL

THE GROWING IMPORTANCE OF ENDRIN IN PLANT PEST CONTROL

ENDRIN ANSWERS MANY NEEDS—Velsicol Endrin fills the need for an insecticide of relatively low toxicity to humans that will kill a wide variety of plant pests that are either resistant to other insecticides, or difficult to control. It is a chlorinated hydrocarbon, with lasting residual qualities. Although it has greater insecticidal activity than other chlorinated hydrocarbons, it can be used safely by individual farmers. It is also economical.

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RED BANDED LEAF ROLLER CONTROL ON APPLES—Endrin now has label acceptance for control of red banded leaf rollers on apples. In grower trials, it has been proven effective against even resistant leaf rollers. The same dosage will also kill plum curculios, which results in a considerable economy for the apple grower.

VELSICOL PROMOTIONS—During 1960, Velsicol Endrin will be promoted in various areas for major uses. These promotions will include advertising to farmers and dealer sales support. Details will be released as available.

ADVANTAGES OF VELSICOL ENDRIN—Velsicol Endrin is easy to formulate. The white Endrin crystals dissolve quickly, and make bright, clear emulsifiable concentrates. The fine particles mix uniformly and grind easily, to help make top quality dry formulations. Velsicol Endrin is packaged conveniently, in 100 pound fiber board containers with telescopic slip-on covers. These containers are of narrow diameter, for easy lifting and pouring, and have a polyethylene lining, which permits drums to be completely emptied without loss of material.

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FC Report on 12th Annual Joint Midwestern

Agronomists-Industry Meeting

R. E. Bennett, Farm Fert. Co.; W. M. Newman and J. D. Stewart, Jr., Federal Chem.

Above left: Paul Lomand, C. W. Johnson and Alan Judkins, all from U. S. Steel.

Above: R. M. Morehead, Olin Mathieson; Larry Beckman, LaPlata Chemical Co.; and Paul Marshall, Comm. Solvents Corp.

Left: Jos. Mealy, IMC; A. G. James, Post Fert.; Paul Goldstein, Effingham Quality; R. W. Lawler, Illinois Farm Supply.

Above: F. A. Geary and Leonard Schrader, Standard Oil; Loren Johnson, U. S. Steel.

Above right: John W. Hall, PCA; Dr. H. B. Mann, API; and Ralph Fraser, Summers Fert.

Right: Robert Masaner, John O. Frahm and Philip Rarriden of W. Va. Pulp and Paper.

Above left: Kirk Wagenseller, Swift & Company; Robert Fitzgerald, Smith-Douglass and H. S. Hopewell, Swift & Company.

Above: E. T. Potterton, IMC; Paul Potterton, U. of Wis.; John Zigler, IMC.

Left: C. E. Trunkey, U. S. Indust. Chem.; James McIntosh, National Fertilizer Co.; and T. E. Martin, U. S. Industrial Chem.

THE largest registration in the history of the Joint Midwestern Meeting of Agronomists and Fertilizer Industry Representatives was realized at the 12th annual meeting held at the Edgewater Beach Hotel, February 11–12.

Agronomists and industry representatives presented the results of their research to more than 700 agronomists, industry men and representatives of allied industries.

Dr. Stanley A. Barber, of the Purdue University agronomy staff, said Indiana farmers are now using an average of 185 pounds of fertilizer per cultivated acre, compared to 135 pounds a decade ago.

Nitrogen does a better crop feeding job when the soil is well supplied with phosphate and potash fertilizer, Dr. C. M. Woodruff, University of Missouri soil scientist reported today.

Results of an intensified soil fertility program that could add $1,000,000 to the farm income of Guernsey County, Ohio, were summarized in a report here today by Dr. Harold Shoemaker, Ohio State University Extension agronomist and Oscar Share, agricultural extension agent of Guernsey county.

Farmers who cooperated in an intensified fertilizer demonstration program in Miami County, Ohio, got back $2 for every dollar in-

J. J. Devlin, Southwest Potash Co.; C. E. Workman, U. S. Phosphoric and T. E. Camp, Southwest Potash Co.

Warren Huff and John E. Foy Jr., both representing Ashcraft-Wilkinson Co.

vested in fertilizing pasture, despite a droughty 1959 season and a 9-inch shortage in rainfall.

Fertilizer-using farmers could profitably use three times the amount of plant food they are now applying, according to a report released here today by two Iowa State University rural sociologists —Dr. Joseph M. Bohlen and Dr. Geo. M. Beal.

Dealers Have Key Role

Bohlen and Beal cited a recent Iowa survey which indicates that dealers play a key role in influencing farmers' decisions about fertilizer use. The survey covered 315 farmers who work 40 or more acres each. It also included 118 fertilizer dealers.

More than 96 per cent of the farmers interviewed said they expect dealers to be a "reliable source of information about fertilizer use." (See FARM CHEMICALS—June '59 and Feb. '60)

Irrigation plus adequate fertilization can boost corn yields as much as 50 to 65 bushels per acre, said Dr. F. E. Shubeck, South Dakota Agricultural College agronomist.

Dr. J. F. Davis, Michigan State University soils scientist, reported that band placement of fertilizer has boosted small grain yields as much as 15 bushels per acre. ▲

John Abbott, Ashkum Fert. Co., compares notes with G. C. Kempson of Monsanto.

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Are marketing costs

EXPENSE or INVESTMENT?

By HECTOR LAZO

THE DAY is fast approaching when advertising, new product development, establishment of a new territory and other marketing functions will be regarded as *investments*—not current costs.

For those companies which are not *market-oriented* this article will be about as useful as a barber shop on the moon. Adoption of these ideas will require entirely *new thinking*—not only on the part of marketing management, but on the part of *top* management, *accounting* management, and, *decidedly not the least*, Government!

But it can and should be done.

NEW CONCEPTS IN ACCOUNTING MANAGEMENT

Fortunately, some of the more advanced thinkers in the field have come forward to advocate some bold new concepts of accounting management. Among them we find two that merit particular mention: Dr. Michael Schiff, professor of accounting and chairman of the accounting department, Graduate School of Business Administration, New York University; and Dr. Martin R. Gainsbrugh, chief economist of the National Industrial Conference Board, who also teaches in an adjunct capacity at the Graduate School of Business Administration of N.Y.U.

What both of these men—one an economist and the other a professional accountant—advocate is that we consider certain marketing functions as long-term investments rather than current costs.

In this manner, we will be able to "capitalize" certain types of "expense" which produce long-term, rather than immediate, profits.

When you buy a new rotary kiln the transaction is entered on the books as an investment. In other words, *increased production* is expected to result. It makes just as good sense for the three marketing functions listed above to be considered investments.

All that is needed is a realistic yardstick by which we can measure the dollars-and-cents contribution of each of these marketing activities!

Before attempting to measure the particular effort,

What's holding up adoption of modern accounting techniques?

Under the modern Marketing Concept (See "Marketing in the Sixties," December 1959 and January 1960 issues) "Management" expects that "Marketing" will deliver in three areas which involve costs. They are:

▶ Marketing will maintain controls and utilize modern techniques—including sales and distributor audits, to improve the sales-cost ratio . . . in the overall and in each sales territory.

▶ That Marketing will establish and maintain close coordination with Finance, Engineering, Purchasing and Production, so that the total company effort may be geared at *profitable* performance.

▶ That Marketing will develop techniques for measuring, quantitatively wherever possible (in dollars and cents) the effectiveness of the various marketing functions.

This "expectation", which in itself is only a partial list of the "things Top Management expects from Marketing" under the Marketing Concept, stems from the realization that one of the major obstacles to the application of scientific management to marketing stems from *faulty financial attitude and knowledge.*

This, in turn, may well be the result of the failure on the part of business to sell its own employees on the role and importance of profits.

Instead of apologizing for profits (the lifeblood of competitive business), business should have devoted itself to educating its employees—white collar as well as blue collar—on the fact that only *profitable* business can pay wages . . . increase wages . . . pay fringe benefits . . . and employ people gainfully.

Unprofitable business can not give its employees security of any kind. The sooner every person who works for a living in a free economy understands the role of profits as a guarantor of jobs, of progress and

investment or activity, we must know *what it was expected to do.* Against this expectation we *evaluate results.*

THE FALLACY OF "CURRENT COSTS"

Modern marketing is nothing if it is not *profitable* customer-making. Yet, what goes into the making of a *profitable customer* is largely carried on the books as *cost.*

But what goes into the making of a product we sell that customer is carried as an *investment.* Thus, *profitable product-making* is an investment—but *profitable customer-making is a cost!*

For years we have been echoing and re-echoing the statement that "all income comes from sales." Hence, all *profits* must come from sales—that is, sales intake producing excess of income over costs.

But it is the *combined* or total sales effort that really produces profitable sales! This total sales effort includes inventories, distribution plant and equipment, manpower allocation, personal sales effort, promotional effort, product research and development, marketing policies, sales policies and terms, pricing, marketing research and on and on!

What brings in the operating funds with which we acquire the conventional "assets" if it isn't the profitable total sales effort?

A complete discussion of this philosophy is set off separately from this article for those who want delve deeper. Now let's take the three marketing areas and attempt to measure the dollars-and-cents contribution of each.

SETTING UP A NEW TERRITORY

Dr. Michael Schiff points out that it is possible to evaluate a new territory by capitalizing it on the basis of current earnings.

Now every businessman who has ever opened up a new territory knows full well the difficulty of pinpointing "actual costs." How does one separate those costs which common sense indicates will not be typical, or recurring, or of such a nature that they might be reasonably anticipated in opening up other territories in the future?

Let's attempt to capitalize a territory on the basis of current earnings. Suppose we were a farm implement manufacturer and our total sales in 1959 were $13,600,000. Typically, we might find that materials going into our products cost us 35.3%; direct labor, 34.7%; our selling costs, 11.7%; overhead and administrative, 9.75%.

Our profits, therefore, would be 8.45%.

We open a new territory—say the State of Nebraska—and we find that the profit return in that new territory was *not* 8.45% . . . *but 11%.* The territory is new, we have an aggressive man, our product was new there, an immediate market was there, and the farm income that particular year was considerably better than average.

The combination of favorable factors yields a very good *ratio.* Are we justified in capitalizing that new territory at that rate and giving it a valuation on that basis? Subsequent years may be materially below that first year.

Well, these are *difficulties,* and not insurmountable *obstacles.* Like carrying out cost analyses on the basis of product or customer groups, *great care must be exercised.* Neither the products nor the customers are exactly (and often not even substantially) alike in the factors that bear upon cost. But it can be done "scientifically"—in fact, *is being done* every day by competent accountants.

(Continued on next page)

security, the sooner we will be able to make every employee "profit conscious."

This means that every employee will not only understand but willingly (selfishly) *cooperate* in protecting and enhancing the company's profits—*because he personally gets so much benefit from these company profits.*

We need some entirely new financial thinking—bold and imaginative! We need to get away from some of the old, established and cherished *financial cliches* . . . generally accepted *past ratios* . . . and generally accepted notions which have surrounded our financial policies and attitudes.

DEFINITION OF "ASSETS"

In conventional accounting, "assets" are "the resources of a person or business—consisting of such items as real property, machinery, inventories, notes, securities, cash, etc."—a "detailed listing of property owned by a firm and money owing to it."

In *modern* accounting—in accounting which is to be the good right arm of profitable marketing in business—can we continue to classify share of market (consumer franchise), territorial organization, advertising and promotion, new product research and development, as *costs* instead of *assets?*

What brings in the operating funds with which we acquire the conventional "assets" if it isn't the profitable *total* sales effort?

One of the important characteristics of an asset is that its value can be established and measured from a dollars and cents point of view. Thus, we "invest" $28,000 in a machine, "capitalize" it is an "investment", a "capital asset" which is depreciated at a regular rate until it is finally "written off", and presumably it has "paid for itself." In other words, it has earned its value by production. Through systematic depreciation over the years we "recover" its actual cost, if not its replacement cost, and thus it becomes a "long term investment."

And no intelligent marketing man quarrels with that!

But pay out $28,000 for advertising, whose effect,

NOW LET'S TAKE ADVERTISING . . .

We have sufficient evidence to show that while it is not, at present, possible to demonstrate *parallel* increases in sales with increases in advertising, there is a demonstrable return from *sustained* advertising.

This has been especially true in studies of companies in given lines of business which have recovered much faster and more effectively from recessions. They were the ones which continued and even *increased* advertising investment in periods of decreasing sales!

To charge off advertising during the 1957–58 recession to "current costs" in 1958 would therefore give a distorted ratio of advertising to sales for that period—and an equally distorted picture of returns on investment for 1959-60 during recovery and upswing.

The proof of faulty financial outlook and philosophy is seen in the very method of "advertising appropriation"—setting up the advertising budget as a *percentage of immediate past sales* or at best, as a percentage of *anticipated immediate future sales.*

If sales for the year 1959 were up 10% over the (ill-fated) year 1958, advertising is upped accordingly, and then we sit back and "discover" a direct ratio between advertising "expenditures" and sales!

We cut the amount invested in advertising at the very time when we need it most (when sales go down), because we regard advertising as a current cost rather than a long term investment, whose benefits (like those of a new machine or a new gadget) will be gathered in the future.

By its very definition, an "investment" implies a *long-term* relationship. This relationship will manifest itself in repeat orders, in better trade relations, in improved "company image", etc.

Hence, advertising should be viewed as a long-term investment, and not as one from which immediate returns can or should be expected in the form of immediate orders.

It will obviously take some time for such an acceptable advertising theory to be developed, but with the aid of accounting management, the end seems in sight.

HOW RESEARCH-DEVELOPMENT IS IGNORED

Does the so-called average "man on the street"—in fact, industry itself—really understood that cost of production is more than just the "sum total of cost of materials, labor and reasonable overhead divided by the number of units produced"? What about the cost of research and development which is—sometimes long-drawn out . . . sometimes spectacularly expensive?

Whether we are establishing a new territory, opening up a new area, or creating a totally new product or market the returns will continue to come in for many years to come.

The cost of doing this is incorrectly labeled "current cost." The income (including profits, remember) is in *the future.*

How else can you actually measure "investment" except by *continuing profitable return*—returns that continue into the future?

Now, there are many immediate objections, especially, perhaps, with advertising. This is a yearly recurring cost (the opening of a new territory is not). Research and development is also a recurring cost.

We can therefore foresee difficulties with the Bureau of Internal Revenue, with the orthodox accounting fraternity, and also with the Treasurer of our company. *Why* capitalize this? It will *not* increase profits as such. It *will* bring a host of new problems and the over-all cost of doing this may indeed be heavy.

All these objections are true.

But scientific management calls for scientific *measurement and appraisal.* In conclusion, I repeat: before we can measure anything, we first must know what it was intended to do, what the *expectations* were from the effort, the investment, or the activity. Against this expectation, we evaluate the results. ▲

as most marketing people know, is cumulative, and hence *long-term*, and the Accounting Department enters that as a "current cost", its asset value ephemeral at best, forgotten in the "quarterly statement", and still looked upon by many "production" people as wasted!

SOME FUNCTIONS CAN'T BE MEASURED

We must in all fairness hasten to point out that not every marketing function can thus be measured or "capitalized."

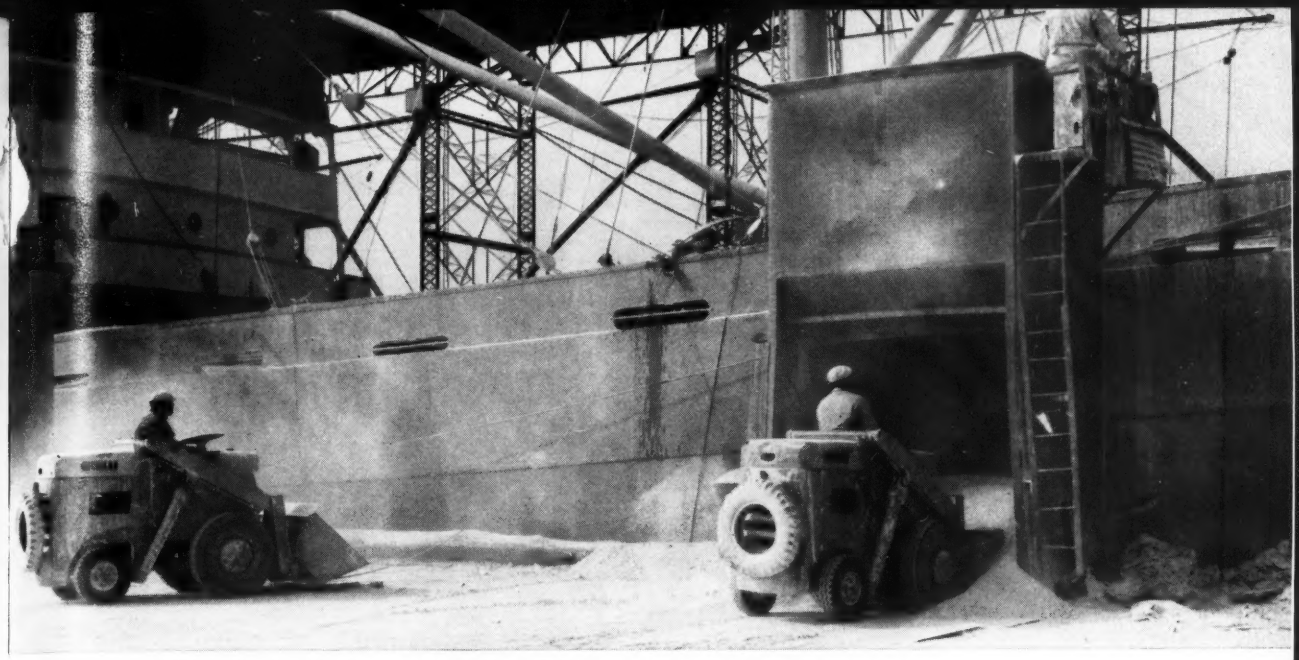
For example, it would be very difficult indeed to "capitalize" the value (dollars and cents cost PLUS the benefits anticipated and derived) from a marketing research study.

Similarly, a good public relations program designed to create a favorable company image (the picture of the company behind the product). It may have cost $5,000 or it may have cost twice that much. At what rate do you "amortize" this to make it an *investment?*

A good company image continues and persists as long as you don't destroy it through some ill-advised act. It does not lose "value", but rather gains and increases over the years. You never, but never, "write it off." You can destroy it, seriously damage it, but once created, it *enhances* in value unless and until you damage or destroy it. How do you "capitalize" such an asset? For surely, a good company image is an *asset!*

Accountants have given up on this one, and good company image (company good will) is now carried generally as $1. Yet only a few years ago, companies carried "good will" on their books at $6,000,000, $25,000,000, even $100,000,000 and more.

What caused the change? The discovery that good will, what we now universally call "the company image", is literally invaluable . . . you cannot measure in dollars and cents the "value" of a company's good will. As most companies would agree today, creating good will is everybody's business in a firm; but it would be the primary responsibility of the public relations department. ▲



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On Philadelphia's waterfront, eight high-speed tractor shovels are moving the amazing total of two million pounds of bulk material *every 8 hour shift!*

The machines are 16 cubic foot Model 12B Michigans. Their job, for Independent Pier Co., is to transfer England-imported china clay from temporary shipside hoppers to waiting rail cars and storage bins. Despite the high-volume output, it's not an easy assignment. Material, when disturbed, rises in choking clouds of dust, quickly covering men and machines. Loads must be moved through traffic 60 *to 900 feet*. And all work has to be done quickly to minimize high dock charges.

Under these pressures, Independent Pier has developed probably the fastest operation of its type along the waterfront—built around the speed and mobility of the eight Michigans.

Load-unload cycle averages 58 seconds

Approaching the hopper head-on, bucket skimming the dock, a Michigan in typical operation thrusts into the heaped clay. With flick of tilt-action lever, operator brings up his pay-load. No time is lost in repeated bucking; Michigan's pry-out action heaps bucket in a few seconds. At same instant, a flip of the forward-reverse lever backs the Michigan out of the hopper in a fast, tight turn. In "forward" again, the Michigan races for a boxcar, barely slowing to turn in—even through narrow six-foot doors. To heap

the clay as high as possible in either end of the car, the Michigan charges up the slope as if it were a hill. At top, operator simultaneously dumps bucket and power-shifts into reverse; the Model 12B backs down and swings out the door, ready to repeat the cycle. Operating at top speed through thick dust fog, over round trip haul cycles of 120 to 1800 feet, the Michigans have established a load-unload average of only 58 seconds!

Maintenance, new operators no problem

"Maintenance-wise" says master mechanic Mike Snowden Jr, "there's no comparison between these Michigans and other equipment. They not only need a lot less attention, they're much easier to service. A quick check at lunchtime—mainly knocking dust out of air filters—keeps them in top shape. Ruggedness and ease of operation are advantages, too. Hiring new stevedores every day means new operators for the Michigans—and *could* cause trouble. But new men learn fast on those simplified controls. They don't have to fight a clutch, either, and power steering is a big help pushing around in that clay."

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. . . *different roles*

"Fertilizer is a modern wonder . . ."

Hundreds of users of the National Plant Food Institute's new "Super Salesman"—a 200-page Fertilizer Salesman's Handbook—will recall those opening words in Dr. Russell Coleman's unique introductory remarks.

Dr. Russell Coleman

DR. COLEMAN, executive vice president of the NPFI since its formation in 1955, has been named president of a newly formed international research and educational organization to be known as The Sulphur Institute.

The Sulphur Institute, a sponsored research and educational organization, is to be responsible for the expansion of sulphur consumption throughout the world. Institute studies will relate to the value of both existing and new uses of sulphur.

Dr. Coleman, a noted fertilizer marketing exponent, brings to The Sulphur Institute many years of experience. His knowledge of farmer needs, expressed so aptly in the Introduction of the Fertilizer Salesman's Handbook, will prove invaluable in guiding The Sulphur Institute in developing proper channels of communications. We quote Dr. Coleman:

"We haven't been communicating . . . with our customers. At least they haven't got the point. And if that's true, we haven't been putting it over too well!"

The twin pillars of successful selling are—Understanding the customer and knowing the product, Dr. Coleman has emphasized.

FARM CHEMICALS extends sincerest congratulations and best wishes to Dr. Coleman on his appointment as president of The Sulphur Institute.

Paul T. Truitt

PAUL T. TRUITT was elected president of the National Plant Food Institute last month. He succeeds J. D. Stewart, Jr., Louisville, Ky., who was elected to the newly-created position of vice chairman of the Board of Directors.

Mr. Truitt has been executive vice president of the NPFI since July 1955. It can be expected that the same vigorous promotion that has always been the standard of the Institute will be emphasized.

As executive vice president of the NPFI, he has been active in traffic matters, especially in fighting freight rate increases which would have ultimately resulted in an increased cost of fertilizers to farmers.

Paul Truitt is recognized as being familiar with the needs of the fertilizer industry and has been active in promotion of safety in fertilizer plants.

FARM CHEMICALS extends congratulations to Mr. Truitt and continued success with the NPFI.

TANK CAR DELIVERY OF MOLTEN SULPHUR

Loading Tank Cars at one of our mines

...an important phase of TGS Service

This is a service of interest to the rapidly increasing number of companies preferring to receive their sulphur deliveries in molten form so that they can transfer directly from cars into consumption. We are equipped now to deliver molten sulphur by tank car from all mines and recovery plants to any place in the country. Detailed instruction sheets and drawings are available on request for those in the planning stage or who do not have adequate or proper facilities for handling and storing molten sulphur.

TEXAS GULF SULPHUR COMPANY
75 East 45th St., New York 17, N. Y. / 811 Rusk Ave., Houston 2, Texas

Sulphur Producing Units: Newgulf, Texas • Spindletop, Texas • Moss Bluff, Texas • Fannett, Texas • Worland, Wyoming • Okotoks, Alberta, Canada.

YOUR H

By PAUL BERNARD
Doane Agricultural Service, Inc.

IN ANY MARKET research project it is usually not enough to know simply how many consumers there are and where they are located. This is important, of course, but it is also important to know who buys the products we sell, where he buys them, how they are applied, where he gets information on herbicide use, and all manner of characteristics concerning the buyer and his behavior.

The ideal situation would be to know all these things about every conceivable type of herbicide customer. Obviously, this is not practical nor is it necessary. Through an accurate sample that represents the farm market, it is possible to make conclusions regarding most herbicide users—non-users as well.

THE HERBICIDE USER

What can we say then, about this man who elects to use chemical weed control rather than mechanical control or no control at all?

Nationally speaking, our friend the "average" herbicide user has characteristics that make him look pretty much like this:

His farm income is in the $5,000—$10,000 bracket and he farms between 100 and 220 acres. Much of his acreage is devoted to corn or wheat. If he is not in these income and size brackets, he is more likely to be in a higher income and larger farm size group than in the lower income and smaller size category. He spent about $44 for herbicides in 1959; the chemicals were probably bought from a feed and seed store. Although he is rather strongly motivated by price in making his choice of dealers, he is influenced to a much greater extent by other characteristics of the dealer such as his knowledge and experience, location, other items handled, etc.

The herbicide customer is very interested in herbicides but does not really know much about them. Moreover, he does not feel that the dealer is capable of giving him expert advice on chemical weed control. Consequently, when he has questions regarding the use of herbicides, he seeks information through the State college or Extension Service. He does not rely very heavily on his neighbor or other farmers for information, possibly because he feels that, since many herbicides are comparatively new, his neighbor may not have had much experience with them.

With regard to the application of the herbicides, the research can also supply some very important information. It is unlikely that the typical herbicide customer hired the job done. In fact, it is more likely he helped someone else with the application than had someone do the work for him. He is not very familiar with granular materials as yet, but he is strongly susceptible to new improvements and recognizes the advantages of granular-form chemicals.

Indications are that he does not have very definite plans, either positively or negatively, regarding his future use of herbicides. His decision to use chemical weed control, then, is probably made rather near the time the chemicals are used.

HOW HE DIFFERS IN VARIOUS AREAS

This portrait of the average herbicide user, of course, is made up of characteristics gathered on a national scale. While the broad picture is sometimes very helpful, it is also important to recognize the value of obtaining information that is as specific as possible. Taking this national information as a starting point let us see how Mr. Typical Consumer differs in various areas of the country. He is actually composed of many typical consumers with widely different characteristics, depending upon the section of the country in which he farms. This information is of vital interest to manufacturers who market in two or more regions of the country.

For example, in the North Atlantic states, the typical herbicide user is definitely a higher-income farmer, usually between $10,000 and $25,000 annual farm income. However, in the South and South Atlantic states, incomes tend to be smaller and the odds are that the average farmer using chemical weed control will fit into the $2,500–$5,000 classification.

There is little regional variance in the grouping of herbicide users according to farm size. In most areas the average herbicide user operates a farm in the 100–219 acre size group except in the Great Plains and Western Corn Belt states and in the South where

EDITOR'S NOTE: *The past two months* FARM CHEMICALS *has featured articles on "How Market Research Can Work For You", drawing specific examples from the 1959 Herbicide Study, conducted by the Doane Agricultural Service.*

Examples were intentionally selected to report market characteristics in terms of dollar sales of herbicides, brand sales, number of farmers using chemical weed control and acres treated with herbicides. It was reported that through the use of such data, management could evaluate the effectiveness of its marketing organization. Further, and perhaps more important, it was also reported how management could use the data to make necessary adjustments in the marketing plan once the evaluation was made.

Previous articles have dealt entirely with characteristics of the market for herbicides. To this point very little in the series has been said about the consumer of herbicides. Since the success or failure of any product ultimately rests with the buyer, it is important to know as much about him as possible. Any marketing program or any research investigation that is not consumer-oriented, is almost certain to end in failure.

Consequently, we asked Doane to prepare this article which places additional emphasis and clarity on the all-important farmer-consumer.

UR HERBICIDE CUSTOMER

the tendency is to find more herbicide users on larger operations of 220–500 acres.

When we consider herbicide treatments, corn is king in almost every region of the country. This is particularly true in the Eastern Corn Belt area and the South Atlantic states where the typical herbicide user concentrates almost all his treatments on corn. In the South, of course, corn is replaced by cotton and rice is important, too, but even here corn is very important. In the West the farmer who treats corn is very much in the minority since most of the applications there are devoted to wheat and other small grain crops. Knowing this type of information in detail, the herbicide marketer can pinpoint his prime targets in each section of the country.

The average herbicide buyer makes his purchase at a feed and seed store. This is very common among users in all areas of the country, particularly among those in the North Atlantic and South Atlantic states. In the Great Plains states and throughout the Corn Belt however, elevators become the most important source of supply. Farm equipment dealers and oil dealers are also popular places to make herbicide purchases in this area.

The herbicide buyer in the Eastern Corn Belt area invests very close to the national average for herbicides, but his counterpart in the Western Corn Belt and Plains area spends at least 15% below the national average. Heaviest investments per herbicide user occur in the South and the West. The herbicide user in these areas spend about 26% more than the national average.

The herbicide user varies considerably throughout the country in his use of customer applicators. In the Northeast and West he is much more likely to use custom application. In the South his use of outside assistance is very infrequent.

Adoption of granular herbicides has been relatively stable among herbicide users throughout the country except in the North Atlantic states. In this region, granular herbicides have been used by twice as many farmers as any other region.

Price is an important factor in determining where the typical herbicide user buys his merchandise. This is especially true in the South. In the West and Northeast, however, the importance of price to the herbicide buyer is much less and dealer services become more important.

THE NON-USER OF HERBICIDES

It is oftentimes as important to be well informed about the non-users of a product or group of products as it is about the users. In the constant effort to obtain more buyers for your product, the entire category of non-users represents a group of farmers particularly worthy of investigation. Both 1958 and 1959 Herbicide Studies also provide an analysis of this group, a summary of which will be included here.

At any point in time—in this case 1959—a group of non-users may logically be divided into two general groups consisting of the ones who have at some previous time used the product, and those who have never used it. The reasons why these two groups do not use the products can also be divided into two categories. The farmer who has had previous experience with herbicides may not use them now because of several basic reasons: his previous experience was unsatisfactory; he no longer has a weed problem, or he could not get the job done at the proper time. Of course, there are other reasons that fall into a relatively unimportant miscellaneous category.

TWO BASIC REASONS FOR NON-USE

The study reveals that there are two basic reasons why the "have-never-used" farmers are non-users: (1) they haven't the money to invest in herbicides (nor in many other production items they need) (2) there is a natural apprehension involved in the use of the chemicals and the machinery for handling them. There were very definite indications in the study that a rather deep-seated fear exists among farmers that they will harm themselves and/or their livestock and crops by using herbicides about which they are unfamiliar.

About 1 out of 5 commercial farmers falls into the "have-never-used" category.

It has been pointed out previously that the Extension Service has been a most influential tool in the promotion of chemical weed control. In the case of non-users of herbicides, however, it appears that the Extension Service is much less important as a source of information about herbicides. On the other hand, neighboring farmers and dealers are a factor of greater importance to the non-users.

Almost 40% of the group not using herbicides said they should have used chemical control and an additional 21% were not sure. Almost one-fourth of the non-users said they will use herbicides in 1960.

With the knowledge assembled through the Herbicide Studies, the chemical industry has gained a more thorough insight into that complex individual called the Herbicide Customer. Many new facts have been brought to light on which sales and advertising people can make sound decisions. As future studies of the herbicide market are conducted each year additional knowledge will become available that will help the herbicide industry to more completely understand the farmer and his use or lack of use of chemical weed control. ▲

how to build sales like sixty in '60

Use of a flannelboard in his presentations at sales development meetings gives George Kalteissen impact, flexibility and control.

BUILD sales the way you build a house—solid, lasting! George A. Kalteissen, eastern sales manager of direct application materials for Nitrogen Division, Allied Chemical Corp., invokes some sound soul-searching from his sales staff with his graphic flannelboard presentation.

He introduced the primary areas of sales construction at various eastern sales development conferences and meetings held in Jacksonville, Florida; Raleigh, N. C.; and New York City, N.Y. for managers, salesmen, technical representatives, agronomists, etc.

The use of the flannelboard told the story in a sharp staccato fashion that stressed the areas he wanted to get across. In this type of presentation Kalteissen utilized creative imagination with his "sales house". An excellent medium for the size of his audience, the flannelboard gave him impact, flexibility and control.

He points out that skillful salesmen build sales the way a builder builds a house—solid and lasting! The builder chooses the best materials, the best methods and works hard at his task. Learn from the builder and you can build yourself a houseful of sales and profits.

To nail down record sales for the soaring 60's, don't overlook, ignore, or even discount one item which could mean the difference between having a wonderfully successful year or falling short of the goal you have set for yourself, he continues.

With the use of visuals he builds his "sales house." First he lays the basic foundation of a company. In terms of merchandising it consists of *production, advertising and sales.* For a company to be successful, its foundation must be solid in all of these three departments. When you have a foundation that's *solid all the way through* then you can build with confidence.

Equally important to your building, although in a different way, is the *floor of cooperation* you put on your foundation. Like the floor in a house, it must spread smoothly and evenly over the foundation, unifying the efforts of production, advertising and sales for the most efficient progress toward the common goal: *sales*, Kalteissen said.

Have you ever stumbled on an uneven floor? Stubbing your toes on sales obstacles could be more costly than ever! Salesmen should resolve to do what they can to insure harmony and cooperation in their dealings with production, advertising and sales departments.

Kalteissen really gets things underway when he puts up the wall of his "sales house" labelled *sales effort.* He points out that this is the stage of high gear—and for best results, you had better stay there! There should be no rooms labeled *complacency.* A salesman cannot become complacent without suffering a letdown in results. This will be particularly true in 1960, with its increased production, sharper competition and tight money situation (early in the year, at least), he continued.

"Salesmen should plan ahead" said Kalteissen as he added the windows to the sales house. Just as we

(*Continued on page 38*)

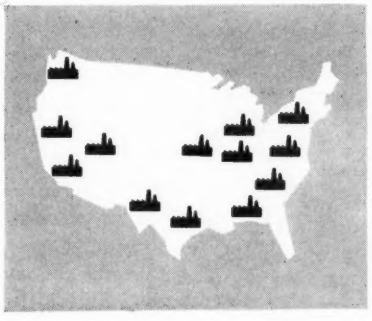
New in '60-better bag service from St.Regis!

All the bags you need!

When and where you need them!

Now the Bag Division of St. Regis offers you *fast* delivery of bags on a local or national basis to meet your peak season requirements. From thirteen bag plants strategically located in the major marketing areas, St. Regis can now supply you with a complete line of the finest bags made—Multiwall, Textile, and WPPL—delivered *when* and *where* you need them.

This new, expanded service is part of our "Packaging-in-Depth" program



designed to serve *you*, the bag user, better than ever before. Besides the thirteen bag manufacturing plants, it includes thirty-three sales offices throughout the country for fully integrated sales and service to meet both your domestic and export bag shipping requirements.

See what a difference fully unified St. Regis sales and service can make. Call your nearest Bag Division man today!

BAG DIVISION **St.Regis** PAPER COMPANY

LONE STAR BAG DIVISION • LUBBOCK BAG DIVISION • WAGNER BAG COMPANY, INC.
CHEMICAL PACKAGING COMPANY • MID-AMERICA BAG DIVISION

Build sales like sixty

(Continued from page 36)

look through the windows for a view of the outside world, so we should look to a successful future by planning ahead.

1) *Plan your time*—Your most valuable asset is the actual time spent selling.

HAVE YOU USED A FLANNELBOARD?

▶ Board can be covered with felt, flannel, terry cloth or casca cloth. Visuals are backed with sandpaper or poston. Colored construction paper can be used without special backing.

▶ It permits you to prepare in advance as well as allowing you to present your material step by step at a reasonable pace.

▶ The visuals can be used as speaking cues. They should be arranged face down for ease in picking up during your presentation.

▶ Tilt your board for smoother presentation and brush the nap of the material for a better clinging surface.

▶ Work from left to right. Working from the side, you will not obstruct the view to your audience.

▶ You can make a dramatic summarization. Review as you remove the visuals from the board.

2) *Plan your travel*—For maximum calls per day . . . and economy, too.

3) *Plan your paperwork*—Get reports, schedules, inventories, etc. in on time. Don't let paper work pile up and become a distraction that could affect your work.

Because no house can be without a door, Kalteissen put one on, labelled *more calls*. He points out that the reasons are obvious: the more calls a salesman makes, the more opportunities to sell. At no time was making *more calls* more important than now. He suggests that one additional call each day be resolved, totaling 165 extra sales opportunities for the year. Personal contact with the customer is still your greatest selling weapon.

Because you have built your sales house soundly and truly there is no reason why you cannot "roof" it with *more sales, more profits for the year.*

"SALES HOUSES" WILL VARY

Kalteissen concluded by saying that while salesmen operate in different sales territories and no two sales situations are alike, the "sales house" will vary, too.

It is up to the individual salesman to indulge in a little self-analysis. Follow the basic plan but the little changes and refinements that are necessary for greatest success are up to you.

The most important thing is to follow the basic building plan in all its time-tested essentials. To ignore any one of these principles will result in a collapse of your "sales house" and ultimately, you could be relegated to the dog house next door. ▲

What is a fair price?

(Continued from page 24)

or manufacturers, have caused them to be bargain-minded. And if someone will cut the price only 5 per cent, the farmer will try to find someone who goes down 10 per cent or even more.

But has that farmer been served? Will he have gotten the service he should have had, the soil test, the careful calculation of probable yields? Will he have gotten the right plant food? And even if so, will he have gotten quality? Not for a price that doesn't leave the seller a fair profit. No one will for long produce quality and render service without the incentives needed to maintain the desire of people to keep on producing quality and rendering service.

YOUR CHOICE!

What way out then? Essential here is that you understand that most people want to give you as much in effort, devotion and enthusiasm as you expect from them, and possibly more—if, and it's a big IF, you inspire them to do so. When you have the right people and the right leadership—and you need both—you will succeed in building volume even in a deteriorated market place. Thus the final answer is: build the management that is capable of making your distributive process work to accomplish its objective of producing a fair profit.

And build policies and programs designed to achieve sales goals. Analyze, step by step, what you have been doing and what you are doing now. If you are convinced you should be doing better, perhaps a lot better—well then, do better! If this means pumping some new blood into your management—pump! If you have a $10,000 a year sales manager, you probably should have a $20,000 a year man—one who can take your sales organization by the scruff of its collective neck and give it the will to win . . . fill it with a passion for productivity, with the spirit of competition. Show your men that come hell and high water *you have backbone, and they will have backbone!*

And so you build salesmen, men who are good competitors. You probably have them now. But you wouldn't know because you haven't given them the tools they need. A cut price is not a tool. It's a crutch, and a pretty feeble one at that. Find out from your men, anonymously if you can so you will learn their true feelings, if they like your policies. I know many fertilizer salesmen. I talk with them if not every week, certainly often enough to know what they would rather do than to get the business by cutting prices. Last spring one company had the guts to call a halt to all price cuts. You should have seen the change in the company's salesmen. Now, they said, we've got something to fight for. And fight they did. . . . for every acre on which to put their fertilizer. Did the company lose sales? For a month or two its position was a bit shaky, but then it happened. Sales went up. And spirits went up. And productivity went up. And with each bit of the men's extra effort something was added to the company's gross, and some of that went into the net. The company is now sitting on a hotbed—but it's not one of inertia. So could you—if you make the right choice. *And the choice is yours!* ▲

Comparing costs, advantages and disadvantages of farmer- vs. custom-

APPLICATION OF LIQUID FERTILIZERS

By RALPH SASSER*

MANY FARMERS and representatives of the Liquid Fertilizer Industry have asked, "Is it best for the farmer to apply his liquid fertilizer or have this job done by a custom operator?" I will give you my views of the advantages and disadvantages of farmer applied fertilizer, and the advantages and disadvantages of custom applied liquid fertilizer. I know you will agree that complete liquid mix fertilizer and liquid nitrogen (sidedressers) are inseparable. Therefore, in my discussion when I speak of liquid fertilizer, I would like you to think in terms of both materials.

I have approached this subject from two different directions, from the farmer's viewpoint and from the manufacturer's viewpoint. First, lets consider the advantages of a farmer applying his own liquid fertilizer material.

ADVANTAGES OF FARMER APPLIED LIQUID FERTILIZER

To Farmer

1) Farmer knowing how much and what.
2) Farmer can make application at most appropriate time (split applications, etc.)
3) Farmer can blame only himself if he has failure, regardless of cause.
4) Farmer should know soil conditions better than custom operator, can decrease or increase rate as needed.
5) Eliminates possibility of receiving inexperienced and inefficient operators.
6) More efficient fertilization program—once farmer is converting gallons of solution to pounds of plant food and learning characteristics of liquid fertilizer, he will do a better job liming; placement of fertilizer, etc.
7) Enables farmer to add special spot treatment to soil (insecticides, etc.).
8) *Most important* is economic advantage if acreage and tonnage justifies. A farmer first must consider the cost of owning and operating this piece of equipment, then he should figure the savings by applying his own material.

The following charts have been prepared to help you determine where the "break-even" point is by owning equipment.

Chart 1 shows fixed cost on three different priced fertilizer applicators.

1. FIXED COSTS

Item	Cost	Life	Interest	Depreciation	Tax & Ins.	Total
Steel	$225	4 yrs.	$ 7	$56	$ 4	**$67**
Stainless Steel H.P.	450	8	13	56	9	**78**
Stainless Steel H.P.	650	10	19	65	13	**97**

Basis for arriving at above figures

1. Interest is charged at 6% of one half the original cost of equipment.
2. Depreciation depends on the annual use of the equipment. In this case I used 4–8–10 years. However, this will vary with the care of the equipment.
3. Taxes and Insurance—used 2%—will vary by county within state. Insurance rates will vary in states.

Chart 2 shows operating cost on same equipment at 30, 40, and 60 acres.

2. OPERATING COST

Item	30 Acres	40 Acres	60 Acres
Steel ($225.00)	$33	$43	$63
St. H.P. (450.00)	35	45	65
St. H.P. (650.00)	27	34	47

Basis for arriving at above figures

1. Repairs—used 1% of total cost—possibility of no repairs on tank if stainless steel. On pump, etc. could be as high as 3 or 4%.
2. Used operating cost of medium size tractor. No fixed cost of tractor charged to applicator.
3. Labor charged at $1.00 per hour.

Chart 3 shows total cost of equipment (fixed + operating).

3. TOTAL COST OF EQUIPMENT

Acres	Steel ($225.00)	Stainless Steel H.P. (450.00)	Stainless Steel H.P. (650.00)
30	$100	$113	$124
40	110	123	131
60	130	143	144
100	171	185	176

Chart prepared to show saving by owning equipment. *(Continued on next page)*

**Assistant County Agricultural Agent, Duplin County, Kenansville, N. C. Presented at the Southern Regional Liquid Fertilizer Conference, Eatonton, Ga., February 9–11.*

CUSTOM APPLICATION

Acres	Steel ($225.00)	Stainless Steel H.P. ($450.00)	Stainless Steel H.P. ($650.00)
30	−$ 2.94	−$ 16.41	−$ 27.06
40	19.38	6.89	− 1.42
60	63.90	50.37	49.86
100	153.10	139.45	148.30

Basis for arriving at above figures

1. In computing savings I used rates of 500 lbs. of complete liquid fertilizer and 80 lbs. of nitrogen per acre—one application of each.
2. Savings of $16.00 per ton for nitrogen and $6.00 per ton for liquid mixed fertilizer.
3. Considered the $225.00 applicator and the $450.00 applicator would cover 3 acres per hour. The $650.00 applicator 4.5 acres per hour.

In summarizing the charts, we can say the farmer with 30 acres cannot justify either of the three machines. The farmer with 40 acres should not own the $650.00 applicator. The farmer with 60 and 100 acres should apply his own materials with the machine that suits his farming operation best for the most economical application.

To Manufacturer

1) Increase tonnage for liquid fertilizer plant
   (A) Farmer will apply more per acre then he will tell custom operator to apply, especially is this true with complete liquid fertilizer.
   (B) Will rent equipment to neighbor, who will use liquid fertilizer.
   (C) Can apply at appropriate time; whereas, if he has to wait for custom operator he might use dry fertilizer.
2) Decreases competition from dry fertilizer materials. Once farmer owns equipment he will use liquid fertilizer even if price is not exactly in line.

DISADVANTAGES OF FARMER APPLIED LIQUID FERTILIZER

1) Requires more nurse-tank equipment to reach a given volume. Individual farmers will have a tendency to tie up equipment by taking out of operation for a period of time, due to weather conditions or jobs he feels are more important.
2) Requires more labor for fertilizer manufacturer—changing equipment from one farm truck to another.
3) Could cause reduction of prices received by custom operator—might do application for neighbor less per acre than custom operator, thus causing dissatisfaction.

ADVANTAGES OF CUSTOM APPLICATION OF LIQUID FERTILIZER

To Farmer

1) Usually more accurate distribution if operator is *well trained*. In most cases custom operator has better equipment that is more accurate than farmer's equipment.
2) Time saving on the part of the farmer.
   (A) Works well for part time farmers.
   (B) Farmer might justify time to better advantage doing another job.
3) Decreases cost of owning equipment. Acreage and tonnage may not be justified for small farmer.
4) Decreases corrosive problems for farmer with related equipment. Spillage on truck, tractors, etc. will cause a certain amount of corrosion.
5) Farmer can use liquid fertilizer and dry fertilizer materials to better economic advantage. Example—farmer might be able to purchase mixed liquid fertilizer cheaper than he could dry fertilizer, and it might be that dry topdresser (nitrogen materials) could be purchased cheaper than liquid.

To Manufacturer

1) Imperative for introduction of new product. Desired volume cannot be reached as quickly without custom applicators.
2) Custom applicators may decrease labor for liquid fertilizer plant. Less time spent changing tanks from one truck to another. Less time spent by manufacturer "trouble shooting."
3) Liquid Fertilizer Plant will need less equipment for giving volume (nurse tanks).
4) Could result in less bookkeeping; if custom operator was set up as dealer and was held responsible for his fertilizer account.

POSSIBLE DISADVANTAGES IN CUSTOM APPLICATION

To Manufacturer

1) Program is only as good as custom applicators.
   (A) Excellent product will be faulted by farmers if operators are inefficient in field.
   (B) In some cases custom operator may not be experienced in selling; thus if too much dependence is placed in this man, could make a higher percentage of bad sales.
   (C) Depending on agreement with custom operator, shrinkage could be greater than if sold directly to farmer. This is true because material is handled more before reaching farmer.

The Liquid Fertilizer Industry will not continue to grow in the Southeast unless we have farmers applying more of their own materials and more efficient custom applicators of liquid materials, and operators that do satisfactory work for the farmer. We must strive to get the best business men as custom operators, because the farmer expects service now with any product he might buy for his farming operations, including fertilizer. One example is *soil sampling*. How many dry fertilizer companies can you name that have salesmen that take such samples for their farmer friends? This custom operator is a salesman for you, whether you are willing to admit it or not. Let's strive to see that he is efficient and experienced.

By all means, let's encourage the farmer to own his equipment if his acreage and tonnage justifies. This will mean that you as a fertilizer manufacturer must have more labor, nurse tanks and equipment, but in the long run it will be more economical, because of increases in volume and satisfied customers.

Farming now has become very competitive and if we in the Southeast expect to compete, we must strive toward efficiency. Therefore, I would like to recommend that you as a manufacturer or farmer analyze the advantages and disadvantages of each method of application. I believe that you will find that both operations have a place in the Southeast. ▲

READER SERVICE

FREE INFORMATION to help you solve fertilizer, pesticide problems

Chemicals

69—GRANULATED DIAMMONIUM PHOSPHATE

Introduction of granulated diammonium phosphate as an addition to the Davison line has been announced by W. R. Grace & Co. Davison Chemical Div. The formula is 16-48-0. The exact 1-3-0 ratio simplifies mixing formulas while contributing to the high analysis character of the mixed product, the company points out. For detailed information on the product,

CIRCLE 69 ON SERVICE CARD

70—RODENTICIDE BAITS

American Fluoride Company is offering dealers a special low price on Diphacin, new anti-coagulant rodenticide. They report that since limited quantities are available, orders are being filled on a first-come-first-serve basis. For full details,

CIRCLE 70 ON SERVICE CARD

71—TREBO-PHOS

American Cyanamid calls its Trebo-Phos "the triple superphosphate with controlled porosity for proper ammoniation." Finished product is a dry, drillable, well-conditioned fertilizer, Cyanamid reports. Complete information is available, by

CIRCLING 71 ON SERVICE CARD

72—SUL-PO-MAG PROGRAM

Full information on the SPM program, designed to boost sales of fertilizers containing Sul-Po-Mag, is available from International Minerals and Chemical Corp. The program acquaints agriculture with the ever-increasing need for magnesium in our soils and includes agriculture magazine ads, plus promotional materials needed to complete the job in your local area. For complete information

CIRCLE 72 ON SERVICE CARD

73—"SALES-BUILDER" PROGRAM

Complete details on Velsicol's 1960 dealers' "Sales-Builder" program are available to formulators and distributors from Velsicol Chemical Corp. The program provides a continuous flow of educational and sales information, and includes an insect control refresher course, guide sheets, a news letter, and promotional literature. Velsicol says the program will help salesmen and dealers during the spring and summer season and give them a wealth of sales training material to use during the fall and winter. For complete information,

CIRCLE 73 ON SERVICE CARD

74—DIXOL NITROGEN SOLUTIONS BOOKLET

A new, convenient guide for the fertilizer production man, on Dixol Nitrogen Solutions, has been published by Commercial Solvents Corp. Included in the booklet are sections on types and uses of nitrogen solutions; ammoniation of superphosphates; ammoniation practice; granulation; formulation; storage of finished fertilizer; shipping, handling and storage of Dixol nitrogen solutions; safety precautions, first-aid measures and reference tables. For your copy

CIRCLE 74 ON SERVICE CARD

75—MICRO-CEL

Seventy-five per cent DDT concentration is possible with Micro-Cel, reports Johns-Manville, producer of the inert synthetic calcium silicate. Other high toxicant concentrations include 50% malathion, 70% toxaphene, 50% heptachlor, 75% aldrin and 50% aramite. Further information is available, by

CIRCLING 75 ON SERVICE CARD

76—BASIC CHEMICALS FROM EASTMAN

Basic chemicals for herbicides, pesticides and animal feeds are produced by Eastman Products, Inc. Among them are acetic, propionic, n-butyric, isobutyric, and 2-ethylhexoic acid; ethyl, isobutyl, 2-ethylhexyl and 2-ethylisohexyl alcohol; isobutyronitrile; manganese sulphate and triethyl phosphate. For shipping information, properties,

CIRCLE 76 ON SERVICE CARD

77—ANCHOR TREBLE

Both pelleted and ammoniation grade Anchor treble superphosphate 45% are available in the West from Wilson & Geo. Meyer & Co. Manufactured at Western Phosphates' Garfield, Utah, plant, the ammoniation grade treble superphosphate is reported to be made for greater nitrogen absorption. For full details,

CIRCLE 77 ON SERVICE CARD

78—EMULSIFIER PAIR

A new emulsifier pair from Stepan Chemical promises to simplify inventories and formulations for formulators of toxicant systems, Stepan reports. Called Toximul R and Toximul S, the pair will emulsify such pesticides as weed killers and chlorinated and phosphate insecticides. Another development, Toximul LF is used for soil insecticides and other toxicants in most liquid fertilizers. Complete information may be obtained on all three products by

CIRCLING 78 ON SERVICE CARD

79—HANDLING & STORAGE OF PHOSPHORIC ACID

"The Handling and Storage of Phosphoric Acid" is the title of a technical service bulletin published by Victor Chemical Works Div. Chapters are included on manufacturing, properties, bulk receiving and storage, storage tank construction, specifications and safety rules. A supplement lists equipment and manufacturers. For your copy,

CIRCLE 79 ON SERVICE CARD

80—WEED KILLER WALL CHART

A convenient wall chart outlining recommendations for use of Stauffer weed killers is available from Stauffer Chemical Co. Included are data on wheat, barley, oats and corn, chemicals, application rates and weeds controlled. Sections also are allocated to control of resistant weeds and brush along fence rows, ditches, roadsides and aerial application methods for treating sage brush, mesquite, shinnery oak, post oak and blackjack oak. Copies are available without charge. Simply

CIRCLE 80 ON SERVICE CARD

Process Equipment

81—INSECTICIDE GRINDING

The full line of Raymond insecticide grinding mills is described in a bulletin published by the Raymond Div. of Combustion Engineering, Inc. The Raymond Roller Mill is well adapted for sulfur grinding, its manufacturer reports, and it can also be used for handling concentrate formulations by making provisions to admit necessary amount of room air into the system. Get your copy of the bulletin, by

CIRCLING 81 ON SERVICE CARD

82—UNI-BLENDER

The Uni-Blender can solve many problems for you, if you mix, grind or blend, says Poulsen Co. It mixes, elevates, grinds and bags—"does almost everything but wind the clock," according to Poulsen. The standard Uni-Blender can handle six to eight 1200 to 1500 lb. batches of field strength dust an hour. A technical bulletin is available.

CIRCLE 82 ON SERVICE CARD

how to use the READER SERVICE CARD

- *Circle number of literature you want*
- *Print or type your name, position, company and address*
- *Clip and mail the Service Card*

See pages 55 and 56 for information on these Reader Service numbers:

98—Hahn Inc.'s 1960 Hi-Boy Line
99—Baker-Perkins Centrifugal Separator
100—Prufcoat's Protective Coating System

83—GOODYEAR PUMPS

Design of its pump is based on a simple Archimedean screw principle utilizing wiping action of a synthetic rubber bonded steel plate wheel on a steel rotor or screw, says Goodyear Pumps Inc. The company compares this feature to the squeegeeing action of a windshield wiper, in contrast to the grinding or rubbing action commonly found with conventional positive displacement pumps. Three sizes are offered: 15, 42 and 220 gpm, each offering maximum discharge pressure of 100 psi and capable of suction lifts up to 29 feet. A partial list of applications includes fertilizer and insecticide spray solutions, ammonium nitrate 10%, ammonium sulfate 10%, calcium nitrate and creosote. For a descriptive brochure

CIRCLE 83 ON SERVICE CARD

84—FOR UNIFORM FINENESS MINIMUM MAINTENANCE

Uniform grinding of limestone and phosphate rock from 20 to 325 mesh is provided with the Bradley Pneumatic Hercules Mill, according to Bradley Pulverizer Co. Because it is installed on a foundation flush with the floor line, the mill reduces foundation costs and simplifies inspection and maintenance. A catalog fully describing the mill is available by

CIRCLING 84 ON SERVICE CARD

85—DOYLE SCRUBBER

Particularly adapted to fertilizer plant applications, the Doyle Scrubber provides an efficient yet simple and rugged means for removing solids and fumes from gas streams, according to Dorr-Oliver. Doyle design makes possible high solids concentration in the scrubber effluent, D-O says, a low water requirement and high heat transfer rates. Full information is available. Just

CIRCLE 85 ON SERVICE CARD

Materials Handling

86—THE 12B MICHIGAN

Tight-packed fertilizer will yield to the Michigan 12B tractor shovel, according to Clark Equipment Co. Capacity of the 12B is 3,000 pounds. Buckets are available to carry from 6 to 27 cubic feet. Details are available from the firm's Construction Machinery Div. Just

CIRCLE 86 ON SERVICE CARD

87—WENDNAGEL WOOD TANKS

Wendnagel & Co., Inc. says wood tanks are suitable for most chemical solutions with a pH between 2 and 11, and polymer liners extend the range from below zero to 14. The firm supplies lined and unlined, prefabricated and ready to erect, or completely erected tanks. Sulfuric acid, phosphoric acid, liquid fertilizers and urea are among the products that can be stored in its tanks, Wendnagel says. For details,

CIRCLE 87 ON SERVICE CARD

88—BULK BODIES

Bulk delivery of fertilizer with any type of truck is made possible by its auger-equipped truck bodies, reports Knoedler Manufacturers. The galvanized steel body is available with weather-tight cover, sack hauling space and a hydraulically operated boom auger to reach storage facilities on the farm. Basic models are 12-ft. and 8-ft. lengths, with top box extensions increasing capacity of each so that actual range of sizes is 2, 2½, 3, 4 and 5 tons. Twin compartments permit hauling different types of fertilizers. For details

CIRCLE 88 ON SERVICE CARD

89—COLLAPSIBLE CONTAINERS

United States Rubber has released an eight-page booklet on its 55-gallon size collapsible container. It covers inflating, filling, handling, emptying and cleaning. A serviceability table lists acids, bases and salts for which the container is suitable. U.S. Rubber reports that the container also is available in 500-gallon and 2500-gallon sizes. To obtain the booklet,

CIRCLE 89 ON SERVICE CARD

Application Equipment

90—THE AG-CAT

Designed specifically for spraying and dusting, the Ag-Cat is certificated for a 1200 lb. hopper load with a 220 hp Continental, reports Grumman Aircraft Engineering Corp. Among its features: external rigging, easily accessible components, interchangeable ailerons and wing panels. Complete information is available. Simply

CIRCLE 90 ON SERVICE CARD

91—FLOMAX PUMP

Recommended for transferring or spraying liquid fertilizers, the Flomax 8 centrifugal pump's all-iron construction permits it to withstand corrosive effects of liquid plant foods, reports its manufacturer, Marine Products Co. The Model 8 is self-contained with its own gasoline engine and requires no power take-off connection. More information is available.

CIRCLE 91 ON SERVICE CARD

92—SCHELM CATALOG

Schelm Brothers, Inc. has released its 1960 catalog describing aluminum tanks, solution transfer units, skids for tanks, pull type applicators, spray booms, repair parts and accessories. Illustrations, dimensions and prices are given. To obtain your copy

CIRCLE 92 ON SERVICE CARD

93—"BRAIN CENTER"

A device for fingertip control of liquid fertilization of the soil under pressure has been announced by Flo-Mix Fertilizers Corp. The gadget is known as the "Brain Center" because it converts anhydrous ammonia into aqua ammonia or combines with a potash solution to form ammonium potash. Of stainless steel construction, the device consists of mixing chambers, valves, pressure gauge and tubes. Flo-Mix says the "brain center" can easily be installed on any type or size farm tractor. For details

CIRCLE 93 ON SERVICE CARD

Packaging

94—CONTINENTAL PACKAGING

Continental Can Co.'s Flav-O-Tainer Bag now is available in 1 lb. to 25 lb. sizes for packaging powdered, flaked, dry or hydroscopic product, the firm states. The firm's Flexible Packaging Div. will forward details. Just

CIRCLE 94 ON SERVICE CARD

95—CUSTOM PACKAGING

Davies Nitrate Co. offers a custom packaging service to fertilizer producers. Both packaging and shipping under your own label can be handled by the company. Nutra-min—a water soluble blend of manganese, iron, copper, zinc, boron and molybdenum—is blended with your material before packaging. To obtain details on the service

CIRCLE 95 ON SERVICE CARD

Miscellaneous

96—FREE MAP: POTATO PRODUCING AREAS

A free map showing "Principal Potato Producing Areas of the United States" is available from the State of Maine. Measuring 22" x 30", the full color map was prepared from information compiled by workers of the Golden Nematode Control Project under supervision of USDA. For your copy,

CIRCLE 96 ON SERVICE CARD

97—BAG CLOSING EQUIPT.

A complete catalog file of Fischbein bag closing equipment has been prepared by Dave Fischbein Co. and is available to readers. Among models described are the Automatic BA-6, with instantaneous start/stop controls. Information also is included on the firm's portable bag closer, which weighs 10½ pounds. To obtain your copy of the file,

CIRCLE 97 ON SERVICE CARD

IT ALL COMES DOWN TO THIS CRITICAL POINT

...the core where ground phosphate rock and phosphoric acid meet to make Trebo-Phos*, the triple superphosphate with controlled porosity for proper ammoniation. American Cyanamid Company, Agricultural Division, New York 20, New York. **Trebo-Phos is American Cyanamid Company's trademark for its triple superphosphate.*

CYANAMID

TREBO-PHOS

TRIPLE SUPERPHOSPHATE

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE

PATENT REVIEWS

By Dr. Melvin Nord

Manufacture of Triple Superphosphate

U. S. 2,913,330. issued Nov. 17, 1959 to Joseph F. Wilson, assigned to Phillips Petroleum Co., relates to the continuous manufacture of granulated or nodulized triple superphosphate from phosphate rock and phosphoric acid. The object of the invention is to eliminate the occurrence of a sticky, gummy product which causes shutdown of equipment. This may be accomplished by either pretreating the ground dry, phosphate rock with a small amount of the total phosphoric acid required by the process, or by blending cured product fines with the phosphate rock-phosphoric acid reaction product at a stage in the process prior to the drying of the same, or a combination of these steps.

The process may be carried out as shown in Fig. 1. The phosphate rock is weighed and conveyed from the fine rock hopper *7* by a belt *8* to a rock pretreater *9* which can be either spray or fog equipment or a high speed mixer. Concentrated phosphoric acid is pumped from a storage tank *11* to the rock pretreater *9*. All of the phosphate rock required for the production of triple superphosphate is thus pretreated with a small quantity of phosphoric acid and the P_2O_5 content of the rock is thereby initially enriched.

This treated rock is passed from the pretreater *9* by a conveyor belt *13* to a cone or cyclone type mixer *14*.

Concentrated phosphoric acid from storage tank *11* is transferred through line *16* to mixer *14* where the final treatment of the pretreated rock with the remaining acid occurs. The acid supplied by line *16* to the mixer *14* can be split into streams or jets and is injected into the mixer *14* tangentially so that the acid will wash the sides of the mixer *14* as it mixes with the pretreated rock. A very rapid reaction ensues between the acid and the finely divided pretreated rock particles.

Conveying to Disintegrator

The resulting dry triple superphosphate is conveyed from the mixer *14* by a belt *17* to a disintegrator *18*. Knives designated as *19* are installed along a cross-section of the belt *17*, and cut the dry triple superphosphate product into strips before it reaches disentegrator *18*. The strips of dry product passed to the disintegrator *18* are broken into small pieces by squirrelcage type cylinders or wheels *21*.

The discharge from the disintegrator *18* is passed to hopper *22* and then to a mixer such as a granulator *23*. Water sprays *24* are provided inside of granulator *23* and provide sufficient moisture to cause the product particles to agglomerate into pellets as they are tumbled inside the granulator *23*.

The pellets of triple superphosphate discharged from the granulator hood *32* are passed by line *33* to a drier *34* to complete the reaction. Air in line *41* forced by blower *42* is mixed with the fuel gas from line *43* and burned in the air heater *44* insulated with fire brick. Secondary or tempering air is introduced by line *46* into the air heater *44* to cool the products of combustion to the desired temperature before they are allowed to enter the drier *34* by line *47*.

The temperature of the hot air used as a drying medium must be rigidly controlled because overheating of phosphorus in the triple superphosphate causes it to revert to a form that is not available to plants and is no longer valuable as a fertilizer. Normally, the air inlet temperature is maintained at about 625–650° F. and the granule temperature is about 195–210° F.

Drier Discharge to Curing

The discharge from drier *34* is conveyed by means of a conveyor belt *48* to a cure pile *49* and then by a conveyor belt *50* to the boot *51* of a product elevator *52* of the bucket type. The drier discharge will be generally cured in the cure pile *49* for a time sufficient to reduce the free acid content in the triple superphosphate as low as possible for satisfactory processing. This period will generally be about seven days. The product elevated in elevator *52* is conveyed to a screen classifying unit *53* which is provided with vibrating screens *54, 55*.

The discharge from the product elevator *52* is discharged from line *56* onto the top screen deck *54*. The material that remains on this deck is returned by line *57* to a hammer mill *58* for crushing and the resulting discharge is conveyed by line *59* to the boot *51* of the elevator *52*. The size of the material that passes through the top screen deck *54* and remains on the lower screen deck *55* is within the desired product limits and is sent by means of line *61* to bulk storage and bagging machines for subsequent sale. ▲

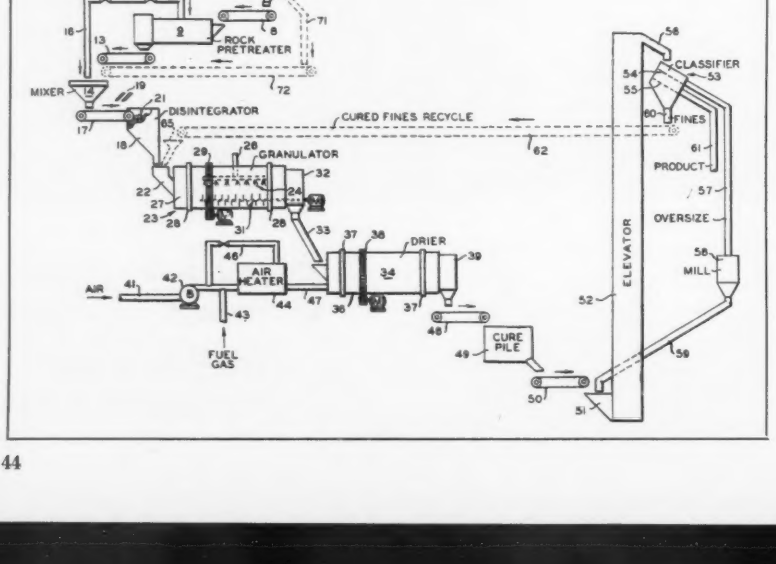


Figure 1.

PEST REPORTS

*By Kelvin Dorward**

First Records of Insects in 1959

ALTHOUGH the importance of early detection of insects new to the United States or introduced established pests new to another area has long been recognized, it appears that the increased emphasis on insect detection is bearing fruit. Early detection of insects new to an area has always been one of the objectives of the cooperative economic insect survey. Recent development of better materials and methods of application together with the success of the second Mediterranean fruit fly campaign, however, stimulated greater interest. Accordingly, in 1957 entomologists and related agricultural workers asked for a stepped-up detection effort. The accelerated program was formally initiated in 1959.

In 1959 there were 10 new records on insects not previously known to be in the United States as compared with 2 new United States records in 1958. There were over 70 new state records in 1959 for insects previously known to be in this country compared with 26 new state records in 1958. This does not necessarily mean that 1959 was the first year that the insects may have been in the area but that it was the first year such occurrence was reported.

Although none of the insects reported for the first time in the United States were considered of the magnitude of the Mediterranean fruit fly or khapra beetle; nevertheless, some are potential economic pests. A ***Cuban May beetle*** (*Phyllophaga bruneri*) was collected in a four mile area of Miami, Florida, in June 1959. In Cuba the beetle is known only from the area around Santiago de las Vegas where it appears to be a rare species. Adult beetles feed primarily on foliage of broad-leaf trees and shrubs, but occasionally damage flowers. The larvae of the beetle damage roots of grasses and it is suspected that the host list might be fairly wide with thorough study. Preliminary studies in Miami found the adults to be feeding on 16 different species of plants.

The ***pumpkin caterpillar*** (*Diaphania indica*) was reported from Florida in November 1959 from collections as early as 1955 but identification was not confirmed until last year. Subsequent reviews of specimens show the insect to have been collected in Florida as early as 1946 as well as in South America and the West Indies. This insect is an important pest of cucurbits wherever it occurs in the Old World, and in the Indian region it is one of the outstanding pests of these crops.

A ***thrips*** (*Haplothrips clarisetis*) was reported from California in March 1959. Later this species caused severe damage to lettuce plantings in New Mexico. A ***pyralid*** (*Aglossa pinguinalis*), a potential stored grain pest, was reported from Massachusetts in August 1959 although it was first collected in the state in 1949. An ***olethreutid moth*** (*Laspeyresia fletcherana*), which infests back of Douglas-fir, was reported from Montana in May.

Other first U. S. records for 1959 included an ***ant*** (*Prionopelta* sp.), a ***wood-boring bostrichid*** (*Sinoxylon conigerum*) and a ***rice root aphid*** (*Tetraneura hirsuta*) all from Florida, a ***talydid*** (*Meconema thalassinum*) from New York and a beneficial insect, a ***wax moth parasite*** (*Apanteles galleriae*), from North Carolina.

Among the insects previously known to be in the United States, the ***face fly*** (*Musca autumnalis*) apparently made the most spectacular spread in 1959. This insect which bothers livestock was first found in this country in New York in 1953, but not until last season was it considered to be of significant economic importance. During 1959 the following states reported the insect for the first time: Virginia, Ohio, Indiana, Illinois, Pennsylvania, Wisconsin, Michigan, Massachusetts, New Hampshire, Delaware, New Jersey, West Virginia, and Vermont. The ***alfalfa weevil*** which was first found in the eastern United States in 1952 in Maryland, and has since rapidly spread in the eastern states, was found in Alabama, Kentucky, and Tennessee last season.

Among other important first state records on insect finds are the white-fringed beetle in Arkansas, the rice weevil in California, the European corn borer in Texas, the khapra beetle also in Texas, the European pine shoot moth in Washington, and the southeastern corn borer in Mississippi.

GENERAL INSECT ACTIVITY

Insect activity was at a rather low ebb during January. ***Greenbugs,*** however, seemed to be on a slight increase in Oklahoma by the latter part of the month. Approximately one-half of the small grain checked in the east central area of Oklahoma was found infested. The majority of the infested fields were in the Arkansas river bottoms where counts ranged from 2 to 25 per linear foot with an average of 9. Greenbug counts in Arkansas, Kansas, and Texas were generally very low.

In Oklahoma counts of the ***spotted alfalfa aphid*** averaged 50 per linear foot in fields checked in Roger Mills county, 100 in Custer county and 2 per linear foot in Jackson county. Counts of 1,000 plus per square foot were found in a few isolated fields of old alfalfa in the Hennessey area of Kingfisher county, Oklahoma.

Among the vegetable insects the ***cabbage looper*** in the lower Rio Grande Valley of Texas appeared to be the most troublesome. This insect also caused damage to lettuce in areas.

A very serious ***German roach*** infestation in a housing project in Lenoir county, North Carolina, was reported by the North Carolina Health Department in late January. This was described by the Department as being the worst infestation ever observed. ▲

*Chief Staff Officer, Survey & Detection Operations, Plant Pest Control Div., Agricultural Research Service, USDA.

NEWS OF THE INDUSTRY

HERCULES BUYS ASSETS OF NITROFORM AGR. CHEMICAL

Hercules Powder Co. announced on February 5 the purchase of assets of the Nitroform Agricultural Chemical Co. of Woonsocket, R. I.

Production of urea-formaldehyde compounds under the tradename of Hercules-Nitroform Blue Chip, a granular free-flowing fertilizer, and Hercules-Nitroform Powder Blue, a wettable powder designed for liquid application, will continue at Woonsocket, R. I., with additional facilities at Hercules, Calif., expected to be on stream by July of this year.

IMC QUARTERLY EARNINGS UP 61% ON 8% SALES GAIN

Net earnings of International Minerals & Chemical Corp. for the second fiscal quarter ended December 31, 1959, were up 61 per cent on an 8 per cent sales gain over the corresponding period a year ago.

Net earnings for the second quarter this year amounted to $1,191,000 or 46 cents per share on the 2,364,062 common shares outstanding, compared with $739,000 or 28 cents per share on the 2,343,327 common shares outstanding a year ago. Second quarter sales totaled $25,276,000 compared with $23,492,000.

Net earnings for the first half of this fiscal year amounted to $1,727,000 or 65 cents per share of common stock, compared with $701,000 or 22 cents per share for the same six months of 1958. Six month sales totaled $47,691,000 compared with $43,655,000.

CYANAMID CONTEST WINNER

Winners of American Cyanamid Co.'s "Haymaker Contest" for fertilizer dealers in the Northeast have been announced by the company's Agricultural Div. More than 500 dealers participated in the contest. First prize winner, Kermit O. Pike, manager of Martin Elevator Co., Martin, Mich., is presented with a Winchester shotgun by Cyanamid district manager Fred W. Overton and sales representative J. W. Dearen. Contestants were asked to figure the number of extra days a cow can be carried on an acre of urea fertilized grass. Pike's correct answer: 201 days.

HOOKER TO EXPAND CHLOR-ALKALI CAPACITY

To increase production capacity of caustic soda, caustic potash and chlorine at its Niagara Falls, N.Y., plant, Hooker Chemical Corp. plans to invest about $10 million in a new installation of Hoechst-Uhde mercury-type electrolytic cells during 1960–1961, according to President Thomas E. Moffitt.

The cell installation should be completed by the late spring of 1961.

Hooker reported record sales and earnings for the fiscal year ended Nov. 30, 1959 of $149,817,496 and $13,401,636, respectively.

SPENCER CHEMICAL SIX MONTH REPORT

In the six months ended December 31, 1959, Spencer Chemical Corp. reports net sales were $24,520,942, up from $23,878,577 a year before. Net income was $1,766,013, equal after preferred dividends, to $1.32 a common share, compared with $1,374,009 or 98 cents a share a year ago.

The second quarter ended December 31 showed net sales of $10,255,840, compared with $11,917,552 a year earlier. Net income of $427,397 was equal to 26 cents a common share, against $654,001 or 46 cents a share a year ago.

NEW PEAKS IN SALES AND EARNINGS FOR DIAMOND ALK.

R. F. Evans, chairman and president of Diamond Alkali Co., has announced that unaudited figures for the year 1959 reached new peaks in sales and earnings.

Preliminary figures show sales of $137,874,000 and earnings of $11,332,000. Compared to the year 1958 sales were 20 per cent higher and earnings increased 75 per cent.

DOW REPORTS SALES AND INCOME FOR SIX MONTHS

Dow Chemical Co. has reported sales of $393,716,483 and net income totaling $45,118,052 for the six months period ended November 30, 1959. The net amounted to $1.66 per share of common stock outstanding.

For the same period in 1958, sales totaled $341,881,379 and net income $28,028,844, or $1.07 per share.

TEXAS GULF SULPHUR PLANS $1 MILLION PLANT IN TEX.

Plans for construction of a plant for treating sulfur by filtration have been announced by Texas Gulf Sulphur Co. To be located at the firm's Spindleton mine near Beaumont, Tex., the plant will operate in connection with nearby shipping facilities at the company's new Neches River terminal.

HERCULES POWDER REPORT

Hercules Powder Co. has reported net sales and operating revenues of $283,650,000 for 1959, an increase of 20 per cent from last year's sales of $236,513,000.

Net income after all charges of $23,500,000, equal to $2.73 a share of common stock, was shown in Hercules' 1959 Annual Report to Stockholders. This compares with 1958 net income of $17,509,000, equal to $2.04 a share of common stock.

AP&CC DIVIDENDS

American Potash & Chemical Corp.'s board of directors on January 26 declared a quarterly dividend of 30 cents a share on the common stock, $1 a share on the $4 cululative preferred stock, Series A, and $1.25 a share on the special preferred stock. Dividends are payable March 15 to shareholders of record March 1.

NEW CORPORATION

Charter of incorporation has been granted O.K. Fertilizer Co., Inc., Guymon, Okla., listing capital stock of $20,000. Incorporators are William L. Garrison, Worth Jeffus and Winifred Jeffus of Guymon.

NIAGARA CHEM. ORGANIZES WESTERN AGR. DEPARTMENT

Formation of the Western Agricultural Department has been announced by Stuart H. Bear, manager, Niagara Chemical Div., Food Machinery and Chemical Corp.

With headquarters in Fresno, Calif., the department is designed to provide more efficient operation. According to Bear, the move was necessitated by expansion of Niagara's West Coast activities through the purchase in early 1959 of Sunland Industries, Inc.

GRANULATING UNIT FOR COTTON PRODUCERS

Cotton Producers Association is adding a fertilizer granulating unit to their Cordele, Georgia, plant. D. M. Weatherly Co. reports it is handling engineering, equipment and construction.

Complete facilities are being installed for ammoniation, drying, cooling, screening and ammonia recovery. Finished product will have a particle size range between six and sixteen mesh.

Calendar

March 22-23. Western Agricultural Chemicals Assn. Spring Meeting, Miramar Hotel, Santa Barbara, Calif.

March 23-25. Meeting of North Central Branch, Entomological Society of America, Schroeder Hotel, Milwaukee, Wis.

March 30-31. Georgia Entomological Society Annual Meeting, New Science Center, University of Georgia, Athens.

April 11-12. Eighth Annual California Fertilizer Conference, McLane Hall, Fresno State College, Fresno, Calif.

June 12-15. National Plant Food Institute Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.

June 21-22. Association of Southern Feed and Fertilizer Control Officials annual meeting, Riverside Hotel, Gatlinburg, Tenn.

June 27-29. Entomological Society of America, Pacific Branch, meeting, Davenport Hotel, Spokane, Wash.

July 13-15. Pacific Northwest Fertilizer Conference, Hotel Utah, Salt Lake City.

August 25-27. Mississippi Soil Fertility & Plant Food Council 1960 meeting, Buena Vista Hotel, Biloxi, Mississippi.

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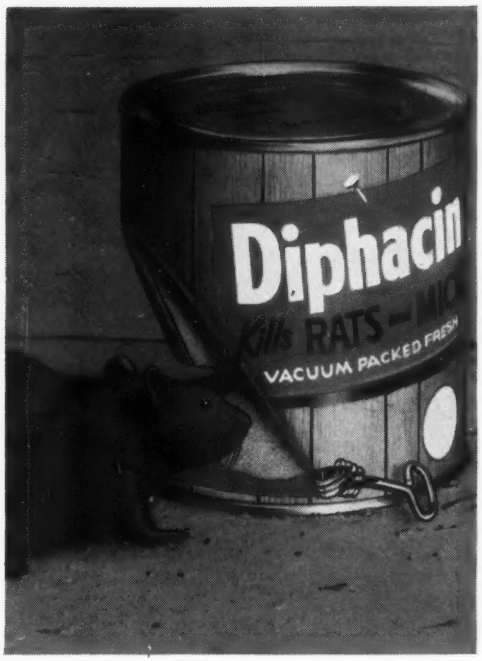


Here's why new Diphacin kills rats and mice FASTER

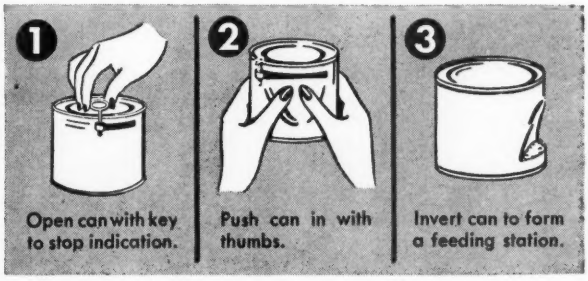
Diphacin is made with a potent new anticoagulant chemical called "*diphacinone*". It's completely clean, odorless and tasteless.

Diphacin is vacuum packed so it will not become stale or rancid. And the rats *like* it. Bait shyness by rodents never becomes a problem with Diphacin. So it will get even the big, tough rats that are unusually hard to kill.

Rodents eat right out of the self-feeder can (see photo). You can recommend Diphacin with the assurance it will kill within 4-7 days, and it's safe around children and animals when used as directed.

Diphacin has been tested and approved by the leading research laboratories in the country. Vacuum packed Diphacin is available at the better farm, drug and grocery stores in your area.

HOW DIPHACIN TIN SERVES AS A FEEDING STATION



New Diphacin

(JUST SAY "DIE-FAS-IN")

See Reader Service #70

Associations Meetings

At the Illinois Custom Spray Operators' Training School, January 27–28, Steve Moore (right), extension entomologist with the University of Illinois and Illinois Natural History Survey, discussed new insecticides with several men in attendance. Left to right; A. F. Beckenholdt, Mansfield, Ill.; Howard Bryson, Lake Fork, Ill.; and Al Renschen, of Breese, Ill.

Discussing the training school program are (seated) J. H. Bigger, Illinois Natural History Survey Entomologist; (standing l to r) John Jacobs, farm advisor in Kendall County, Ill.; William Burr, Rockford; J. R. Dennis, Lake City; and J. R. Davies, Standard Oil Co., Sycamore, Ill.

Attending the Illinois Fertilizer Conference Feb. 4 at Champaign were officers of the Illinois Fertilizer Industry Assn. Left to right: H. L. Stangel, Darling and Co., East St. Louis, treasurer; J. R. Abbott, Ashkum Fertilizer Co., Ashkum, vice-chairman; R. B. Nethery, Federal Chemical Co., Danville, secretary; and R. A. Weis, Virginia-Carolina Chemical Co., East St. Louis, chairman.

NPFI HERSHEY WORKSHOP ATTRACTS 150 PEOPLE

Selling a mental concept—a soil fertility program—as opposed to just selling fertilizer was the theme of the National Plant Food Institute's Northeast Fertilizer Promotion Workshop.

The session, third of three experimental meetings authorized by the Institute's board of directors, was held in Hershey, Pa., January 21.

Devoted to a discussion of sales tools and customer motivation, the meeting attracted some 150 representatives and dealers of NPFI members. Presentations included the potential of fertilizer use in the Northeast, fertilizer economics and sales tools currently available. Effective psychological approaches to farmer customers received special emphasis.

An evaluation of the program by those attending gave it a high rating, NPFI reported.

SAACI ELECTS OFFICERS

George W. Poland, Jr., of E. M. Sergeant Pulp and Chemical Co., Inc., was elected and inducted into office as president of the Salesmen's Association of the American Chemical Industry, Inc., at a recent luncheon in New York City.

Other officers elected for 1960 are Vice President, Preston F. Tinsley, Westvaco Chlor-Alkali Div., Food Machinery & Chemical Corp.; Treasurer, Charles E. Griffith, R. W. Greeff & Co., Inc.; and Secretary, Paul E. McCoy, American Potash & Chemical Corp.

Elected as replacements on the board of directors were Walter C. Deakyne, Jr., Heyden Newport Chemical Corp.; James R. Gilmartin, Pitt-Consol Chemical Co.; James McInnes, Jr., Commercial Solvents Corp.; Arnold Stern, Washine Chemical Corp.; and Dudley P. Jones, Shell Chemical Corp.

CALIF. CONFERENCE THEME: PHOSPHATE FERTILIZATION

Program for the eighth annual California Fertilizer Conference, to be held April 11 and 12 at Fresno, is being developed around a theme of "Phosphate Fertilization," according to its sponsor, the Soil Improvement Committee of the California Fertilizer Association. Three hundred people are expected to attend, including farmers, fertilizer management, salesmen and technicians, official workers of the University and federal and state departments of agriculture.

Formal program is scheduled for the mornings of both days, in the auditorium of McLane Hall, Fresno State College. On the afternoon of the 11th, a field tour of fertilizer plots and demonstrations in the vicinity of the campus will be held.

"Legume Fertilization" will be discussed by a panel on the morning of April 12. "A Banker Looks at Fertilization for Enhanced Loan Security" will be the topic of Earl Coke, vice president, Bank of America, at the annual banquet on the evening of April 11th.

A copy of the program is available from the California Fertilizer Association, 719 K Street, Sacramento 14, Calif.

SEEN AT THE ILLINOIS FERTILIZER CONFERENCE

Industry and university met at the conference. Here are J. F. Taggart, E. I. duPont representative, Danville, Ill.; S. R. Aldrich, University of Illinois agronomist and conference chairman; and H. H. Tucker, Sohio Chemical Co. University of Illinois agricultural specialists spent the day outlining the latest in crops and soils research.

W. L. Nelson (left), American Potash Institute, Lafayette, Ind., and Z. H. Beers, National Plant Food Institute, Chicago, take time out for coffee with M. B. Russell, head of the Department of Agronomy, University of Illinois. More than 250 industry representatives attended the conference.

AGR. AMMONIA INSTITUTE CONVENES IN DALLAS, TEX.

The Agricultural Ammonia Institute's Dallas convention, held in the largest ammonia-consuming state in the nation, heard Dr. Tom Longnecker, director of the High Plains Research Foundation of Plainview, Tex., declare that the use of adequate nitrogen in just 60 East Texas counties could mean $300 million more net income for the state.

The same is true of many other areas, he declared.

Dr. Longnecker's discussion of ammonia's role in agricultural changes was followed by explanations of sales techniques by the Merrett-Adams Training Institute and by Elmer Wheeler of Dallas, merchandising specialist.

H. A. Yeats, treasurer of Southwest Wheel, Inc., declared that advancements in financing and credit knowledge must parallel the expanding role of the ammonia distributor.

Bauserman

Carl Bauserman, who heads Southern Michigan Nitrogen Co. at Richland, Mich., was elected president of AAI for 1960, succeeding S. C. Smith of Uvalde, Tex. Cecil Squibb, Squibb-Taylor, Inc., was elected first vice president; A. J. Schlabach, Aldo Soil Service, second vice president; Robert Blobaum, Great Plains Service, Inc., secretary; David H. Bradford, Jr., Mid-South Chemical Corp., treasurer; S. C. Smith, Smith Co. of Uvalde, committeeman; and Don Stanford, Dow Chemical Co., committeeman.

R. W. Scanlan of Phillips Petroleum Co., chairman of the Agronomy Committee, said a complete bibliography of information on agricultural uses and handling of ammonia was being assembled at the Memphis office for use by the membership.

Jack F. Criswell, AAI executive vice president, outlined the functions of the Institute in a presentation on the final day of the convention.

Weed Group Officers. V. S. Searcy (left) of Auburn University, retiring president, congratulates the new officers of the Southern Weed Conference. They are Dr. R. A. Darrow, Texas A&M College, College Station, Tex., president; Dr. Walter K. Porter, Jr., Louisiana State University, Baton Rouge, vice president; and Dr. R. E. Frans, University of Arkansas, Fayetteville, re-elected secretary-treasurer.

SOUTHERN WEEDOLOGISTS ELECT '60 OFFICERS

New president of the Southern Weed Conference, chosen at the organization's recent Biloxi, Miss., meeting, is R. A. Darrow, of Texas A&M College.

Vice president of the organization of professional weed-control workers, called "weedologists" by retiring president V. S. Searcy, is Walter K. Porter of Louisiana State University. Dr. R. E. Frans, University of Arkansas, was re-elected secretary-treasurer.

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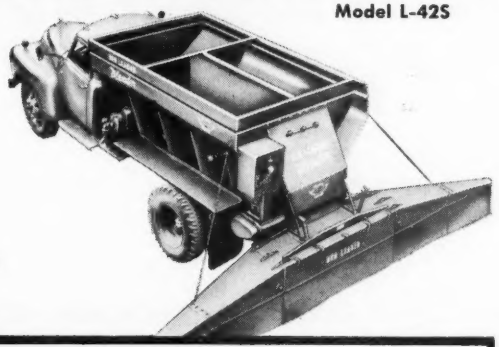

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NEBRASKA HOLDS DEALERS CONFERENCE, EXPOSITION

Lincoln, Nebraska, was the site for the tenth annual fertilizer dealers training conference and third annual fertilizer, machinery and chemical exposition, January 12 and 13. Leo L. Johnson, assistant secretary of the Nebraska Fertilizer Institute, reports that some 700 suppliers, dealers and consumers attended the exposition.

Speakers discussed the supply outlook for N, P and K; financing of fertilizer dealers; who uses fertilizer; what's ahead in minor element needs; controlling insect pests on corn, the use of pesticides and FDA tolerances.

At a meeting of the board of directors of the Nebraska Fertilizer Institute during the exposition, Clay Westcott of Holdrege, Hyle Barndt of South Sioux City and George Tyson of Herman were elected to serve three year terms.

Members of the liquid fertilizer industry within the state voted to organize themselves as the Liquid Fertilizer Div. of the Nebraska Fertilizer Institute. They elected five directors for their group: Tom Walsh, York; Mel Beermann, Dakota City; Roy Block, Gothenburg; George Tyson, Herman; and Clay Westcott, Holdrege.

Tentative dates for next year's exposition are January 10-11.

People

American Cyanamid Co. Maywood W. Chesson, Jr. has been named assistant manager of phosphate operations at the Brewster plant, according to an announcement by Arthur Crago, manager of phosphate operations.

Named chief engineer at the Brewster, Fla., plant was George L. Lyle, Jr. He succeeds W. J. Pace, who retired January 1.

American Potash & Chemical Corp. Calvin L. Dickinson has been named director of manufacturing for the Trona, Calif., and Henderson, Nev., plants. Henry S. Curtis continues as Henderson plant manager reporting to Dickinson. Dr. Howard E. Kremers has been appointed eastern district manager of market development.

Frank McGrane has been appointed manager of the San Francisco office, in addition to his present duties as manager of agricultural chemical sales.

Armour Agricultural Chemical Co. Paul Parks becomes assistant manager of the Cincinnati Div. Upon graduation from the University of Tennessee in 1950 Parks joined the Armour organization as a salesman.

Ashcraft-Wilkinson Co. Robert E. Ashcraft has been elected president, succeeding the late Trenton Tunnell, it has been announced by George W. McCarty, chairman of the board.

Simultaneously, W. Mercer Rowe, Jr., a vice president of the company since 1954, was named executive vice president. O. Ray Yates, manager of the Norfolk, Va., branch, has been made a vice president.

Rowe

Yates

Ashcraft became executive vice president of the company late in 1959. He joined the firm following his graduation from the University of Alabama in 1929.

Rowe joined Ashcraft-Wilkinson in 1947 as vice president and general manager of a subsidiary, Flag Sulphur & Chemical Co. He was named vice president and member of the A-W board of directors in 1954.

Yates, who went to the firm in 1948 as a sales representative, succeeded Ashcraft as branch manager at Norfolk in 1955.

H. J. Baker & Bro., Inc., Retirement of Harold S. McCor-

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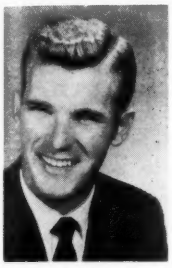
mick after 49 years in the fertilizer and feed business has been announced. Starting his career in 1911 as an office boy with H. J. Baker, McCormick was executive vice president of the company at the time of his retirement. He will continue with the company as a consultant.


Collins

Bradley & Baker. Thomas Collins has joined B&B's Atlanta office as a fertilizer sales representative. A resident of Tampa, Collins will call on manufacturers in Florida.

California Spray-Chemical Corp. Howard J. Grady has been named president and director of Calspray succeeding A. W. Mohr, who retired on February 1. Grady, who was formerly executive vice president of Calspray, also becomes

Grady

Mohr

president of Ortho Agricultural Chemicals Ltd., of Canada.

Grady joined Calspray in 1926 and has been a research entomologist, European representative, branch manager in Portland, Pacific Northwest sales district manager and regional manager of marketing on the East Coast. He was named executive vice president in 1958.

Mohr began his career in 1922 as a chemist and sales engineer with Standard Oil Co. of Calif. He was named to the Calspray board of directors in 1947 and shortly thereafter was elected president of the corporation. Mohr has been extremely active in trade organizations throughout his career. A past president of the National Agricultural Chemicals Association, he is now an NAC board member. He also serves on the board of the National Plant Food Institute.

Central Farmers Fertilizer Co. Avery Stutts, plant manager, resigned after meetings with J. J. Lanter, president, and Paul Cairns, executive vice president. Cairns will take over managerial duties temporarily, it was reported.

Collier Carbon & Chemical Corp. T. C. Henderson becomes vice president, responsible for all manufacturing operations of the company. He has been plant superintendent, manager of process engineering and manager of manufacturing for Collier.

Henderson

A. C. Stewart and Wm. C. Kaesche have been elected members of the board of directors.

Diamond Alkali Co. Frank Chrencik has been named vice president—manufacturing. He is succeeded as general manager of the Electro Chemicals Div. by Arthur B. Tillman.

Eastman Chemical Products, Inc., Chemical Div. Appointment of S. M. Ryburn and G. J. Taylor as district sales managers for the company's industrial and specialty chemicals in the New England and the eastern Pennsylvania, Maryland, Delaware and southern New Jersey areas, respectively, has been announced.

Federal Chemical Co. J. Walter Harding has been elected vice president, administration, and re-elected secretary. Harding has been with the company twelve years, having previously been traffic manager, manager of purchases, and for the past year, secretary and controller.

Harding

Food Machinery and Chemical Corp., Chlor-Alkali Div. Robert A. Bondurant, Jr. becomes manager of the division. Before his appointment, Bondurant was resident manager of the division's soda ash facility near Green River, Wyo.

Geigy Agricultural Chemicals, Div. of Geigy Chemical Corp., has named John B. Plant to its western sales staff. He will represent Geigy in Utah and southern Idaho. From 1955 to 1957, Plant was field representative for California Spray-Chemical Corp. in Orange County, Calif. He acted as dealers' representative for L. H. Butcher Co. until his appointment by Geigy.

Plant

Metz

Hayes-Sammons Chemical Co. Edward H. Metz has been appointed controller of the firm, responsible for accounting, internal auditing, statistics and office services of divisions and subsidiary companies.

International Minerals & Chemical Corp. has announced election of John D. Zigler, general manager of the Plant Food Div., and Joseph M. McGarry, director of public relations, to vice presidents of the company.

Zigler

Zigler, a 27-year employee at IMC, has been general manager of the Plant Food Div. since 1956. He joined the company in 1933 as a salesman in Cincinnati, in 1939 became district sales manager operating from Chicago Heights, Ill., and

later became area operations manager.

Two district sales managers for the Materials Dept. of the Agricultural Chemicals Div. have been announced: Alexander McBride is manager for the Kansas City district and Robert E. Maron is district manager to cover the states of Indiana and Illinois.

Merck Chemical Div., Merck & Co. Dr. Frank L. Cohen has been elected to the new post of vice president for operations. He had been director of production.

Michigan Chemical Corp. has named E. Russell Leach sales manager and Max R. Sias, manager, sales administration.

Mid-South Chemical Corp. D. H. Bradford, Jr., vice president and sales manager, has been elected a director of the corporation.

Panogen Co. appoints four new sales representatives: James H. Hughes, West Coast; J. E. Driggers, Florida, and the southeast United States; Byron R. Hodgin, to assist Gene Crist in Kansas, Oklahoma and Missouri; and Warren K. Dulin, West Texas-New Mexico.

Pennsalt Chemicals Corp. Appointment of Robert S. Toth as sales representative, agricultural chemicals, was announced by J. Drake Watson, general manager, agricultural chemicals. He will establish his headquarters at Pennsalt's new district offices, at 3239 Mayfair Blvd., Fresno, Calif.

Toth

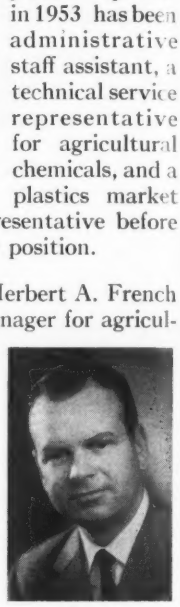
Planters Chemical Corp. R. J. "Bob" Rawls has joined the firm as a salesman to cover the area surrounding Washington, N. C.

Potash Co. of America. Dean R. Gidney has been appointed vice president in charge of sales, succeeding John W. Hall who was elected president in December. The general sales office will continue at its present Washington, D.C., address.

Spencer Chemical Co. Assignment of William Threadgill as manager of agricultural market research has been announced. Threadgill, who joined Spencer in 1953 has been administrative staff assistant, a technical service representative for agricultural chemicals, and a plastics market development representative before accepting his new position.

Threadgill

Promotion of Herbert A. French to advertising manager for agricultural chemicals also was announced. He will supervise all advertising activities for Spencer agricultural products, reporting to M. H. Straight, director of advertising. French also is managing editor of "Today's Fertilizer Dealer," the company's quarterly trade magazine for fertilizer dealers.



French

Union Carbide Chemicals Co., Div. of Union Carbide Corp. Dr. R. C. Back has been named manager of technical development, Crag Agricultural Chemicals. He also will serve as a member of the company's Agricultural Chemicals Marketing Committee.

Back

Velsicol Chemical Corp. Harry A. Sidles has been appointed sales manager, Agricultural Chemicals Div. He replaces Roger W. Roth who has been named assistant to the vice president. Sidles went to Velsicol in 1958 as assistant sales man-

Sidles

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ager. He had been with Rohm & Haas Co.

Virginia-Carolina Chemical Corp. reports two promotions in the Manufacturing Dept., Fertilizer Div. Philip E. Stone, former technical assistant, has been named assistant to manager, and John M. Daniel, Jr., former section leader in Research and Development, becomes technical assistant to the manager. Both are new positions.

Stone

Daniel

Appointment of Robert R. Martin as manager of its Purchasing Dept. also was announced.

Government

CARRYOVER STOCKS OF MANY PESTICIDES LOWER THAN IN '58

Carryover stocks of many leading pesticides on Sept. 30, 1959, were lower than on the same date in 1958, USDA reported last month.

The Department's report, based on an annual survey conducted in cooperation with the National Agricultural Chemicals Association, indicates that stocks of benzene hexachloride, calcium arsenate, 2,4-D, 2,4,5-T, organic phosphorus insecticides as a group, and copper fungicides were down from 27 to 53 per cent at the end of the 1959 growing season from the same time in 1958.

Manufacturers' Stocks of Unmixed Pesticidal Chemicals September 30, 1959

Material	1959 stocks as a percentage of 1958 stocks
Aldrin, chlordane, dieldrin, endrin, heptachlor, toxaphene	144
Benzene hexachloride (gamma basis)	54
10–26 percent gamma grades	48
36 per cent and above, including lindane	62
Calcium arsenate	60
Copper fungicides	83
2,4-D (acid basis; includes producers' formulations)	47
DDT	114
Fumigants (grain and soil; includes mixtures)	121
Lead arsenate	149
Miticides (miscellaneous)	127
Organic phosphorus insecticides	65
Includes: Methyl parathion	43
Parathion	121
Others	362
2,4,5-T (acid basis; includes producers' formulations)	79
Fungicides (miscellaneous)	115
Insecticides (miscellaneous)	64
Weed killers (miscellaneous organic)	296

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... Just came from the bag-filling department... Not a man wearing a respirator.
I'm not surprised, Jim. The men would rather breathe dust than wear heavy old respirators.
I know it. But I'm supposed to enforce safety rules. Oh, for a light, comfortable dust mask!
Here's what you want, men—The Flex-A-Foam Dust Mask—light as a feather!
It's sure light and comfortable, but can it do a man-size job?
It should. It filters non-toxic dust particles 100 times smaller than you can actually see.
Seen Purchasing yet? They're up on new developments.
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Order a trial dozen, Bob. Maybe they'll wear these without continual prodding.
They're glad to wear Flex-A-Foam Dust Masks. Our troubles are over!
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You're right! We should now equip the entire plant!
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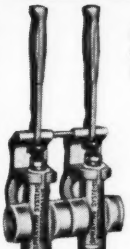

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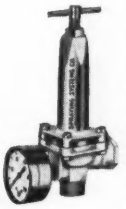

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Diaphragm Pressure Relief Valve —write for Bulletin 101.

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Chemicals

CATTLE PREFER NITROGEN FERTILIZED RANGELANDS

Cattle and sheep prefer to graze on nitrogen fertilized rangelands, according to University of Wyoming agronomists Drs. D. R. Smith and Robert L. Lang.

"Cattle show a definite preference for forage on nitrogen treated plots," says Dr. Smith. "Field studies in the Big Horn Mountains of Wyoming have indicated that 67 pounds of nitrogen per acre will result in greater forage utilization and production on hilltop ranges." He indicated that the application of nitrogen to the entire acreage of lightly grazed areas was more effective in altering large-scale grazing distribution patterns than treating only strips of the rangeland with fertilizer.

ALCO INTRODUCES FLY CAKE

Alco Chemical Co. has announced a new fly control product, Fly Cake. Produced in solid form, the product contains a fly attractant and DDVP. It is shaped like a small donut.

Alco also produces a Fly Bait in both granulated and liquid form, containing DDVP.

V-C TO INTRODUCE NEW FERTILIZER THIS SPRING

Virginia-Carolina Chemical Corp. is introducing a new premium fertilizer, V-C Harvest King, this spring.

The product is fortified with a combination of six trace elements, added to the fertilizer via a mineral mix the company calls "Vitel."

R. Clifton Long, V-C's advertising manager, said V-C has launched "the most intensive advertising and promotion effort ever attempted to introduce a new mixed fertilizer." Albert Sidney Noble of New York City is V-C's advertising agency.

SEVIN CLEARED BY USDA FOR USE ON ORNAMENTALS

New Sevin insecticide has been granted label acceptance by USDA for use on roses and other ornamentals, according to R. H. Wellman, manager of Crag Agricultural Chemicals, Union Carbide Corp.

"We will sell basic Sevin to established packagers of home garden pesticides, who will furnish their own branded products to garden supply dealers," Wellman said.

CHEMAGRO CORP. PUTS DI-SYSTON ON THE MARKET

Di-Syston, a systemic insecticide that gives young cotton plants protection against a variety of insects, has just been placed on the market by Chemagro Corp. The product has been registered by USDA.

Chemagro says several years of field tests show that Di-Syston effectively protects young cotton plants against the attack of aphids, mites and thrips, yet is harmless to predators. In granular form the product is applied to the ground at the same time the cotton seeds are planted. It is reported to give protection against the above insects up to seven weeks after seedling emergence.

ULTRA-PURE PHOSPHORUS MARKETED BY THE OUNCE

"The purest grade of elemental phosphorus that has been produced commercially" is the tag placed on a new product of The American Agricultural Chemical Co.

Soil by the ounce, this "semiconductor grade elemental phosphorus" is roughly three times more valuable than gold. It currently sells for about $100 an ounce.

Primary application of this phosphorus is in the electronics industry as an intermetallic in semi-conductors for high-temperature electronics systems.

NEW PRODUCT CLEARS CANALS OF SUBMERSED WEEDS

Information on a new product for control of submersed water weeds that choke irrigation canals and ponds was presented by Dr. Rene Blondeau, staff member of Shell Development Co.'s agricultural research center, before a recent meeting of the California Weed Control Conference.

The product, Aqualin herbicide, was successfully tested by Shell Chemical Co. in irrigated areas of the western United States. A water-soluble liquid, it is added to canal water with the use of specially designed equipment.

Application methods and dosages vary, Blondeau said, according to canal or pond size, water temperature and density of weed growth. As an example, Aqualin herbicide added to a canal at a concentration of 15 parts per million for five hours may control weeds for as far as 20 miles downstream.

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Uniform Quality Prompt Shipments

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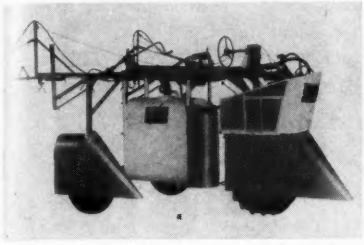
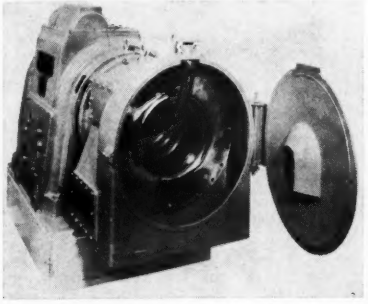


Hahn, Inc. has announced nine new 1960 models of the Hi-Boy, designed for application of liquid fertilizers, for weed control and spraying. New improvements claimed for the Model H-300 shown above include boosting horsepower to 30 and maximum speed to 20 mph; increasing tank capacity to 200 gal. For details,

CIRCLE 98 ON SERVICE CARD

CENTRIFUGAL SEPARATOR FROM BAKER PERKINS



Improved washing efficiency, more thorough washing of the cake with a minimum of wash liquor and increased cake dryness are advantages cited for a new multi-stage, push-type centrifugal separator now offered to chemical processing industries by the Chemical Machinery Div. of Baker-Perkins Inc. It handles a wide range of products from ammonium sulfate, potash and other minerals to plastics and pharmaceutical substances.

The machine, which can be built for capacities of a few hundred pounds to 50 tons per hour, makes use of a multiple number of baskets —telescoped one into the other. The baskets are connected to the hub and pusher mechanism in such a manner that the basket section, which is stationary in the axial sense, is followed by a basket receiving lateral motion from the pusher. Consequently, the end of each basket serves as a pusher for the following stage.

For details,

CIRCLE 99 ON SERVICE CARD

PM-22 PREVENTS SLIPPING OF PLASTIC BAGS

A new water-soluble polymeric adhesive, said to prevent slipping of palletized polyethylene industrial shipping bags, has been announced.

Designated PM-22 the material is reported to resist horizontal shear and permit easy vertical separation of the stacked bags. Because it is water soluble, the new adhesive can be removed easily and does not damage printing or stenciling, the announcement said. Absence or organic solvents eliminates toxicity and fire hazards.

The material is based on a carboxyl containing copolymer made by Monsanto Chemical Co.'s Plastic's Div.

O-I TO PRODUCE HEAVY DUTY PLASTIC SACK

Owens-Illinois Glass Co. reports it will begin production this year of a heavy duty plastic shipping sack

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PLANTS: JERSEY CITY, N. J., CHICAGO, ILL., N. KANSAS CITY, MO., BIRMINGHAM ALA., TEXARKANA, ARK.

$3,000,000 Liquidation Chemical Plant at Orange, Texas. Type 316 Stainless Steel Tanks, Kettles, Heat Exchangers, Columns, Stills, Crystallizers, Centrifugals, Pumps, Valves, etc. Wonderful values. Send for list. Perry Equipment Corp., 1430 N. 6th St., Philadelphia 22, Pa.

FOR SALE: Unused #9 Sturtevant rotary blender, 150 cu. ft. Unused Sprout-Waldron 335 cu. ft. horiz. ribbon mixer. T304 st. st. dry material handling system including: 1800 cu. ft. weigh hoppers; Ajax "Lo-veyor" shaker conveyors; bucket elevators; screw conveyors; all T304 st. st. Send for details. Perry Equipment Corp., 1430 N. 6th St., Phila. 22, Pa.

FOR SALE: (2) 7,750 gal. and (5) 4,650 gal. phenolic lined horizontal storage tanks. Excellent for liquid fertilizer storage. Best Equipment Corporation, 1737 W. Howard St., Chicago 26, Ill. AMbassador 2-1452.

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for industrial and agricultural products.

Tom W. Brown, Jr., general manager of the Multiwall Bag Div. which will handle manufacture and sales of the plastic sack, said limited production of the polyethylene-based sack will begin by spring, with full production scheduled for late summer.

"There will be many large volume products that can still be served better by the multiwall paper bag, but the polyethylene sack will make possible the application of flexible packaging to many industries now using rigid types of containers," Brown said.

PRUFCOAT INTRODUCES ONE-COAT PROTECTIVE COATING SYSTEM

Availability of newly-developed Prufcoat Primastic, a protective coating that combines rust-inhibitive primer properties with the chemical resistance of a catalyzed epoxy coating, has been announced by Prufcoat Laboratories, Inc. According to the manufacturer's technicians, the new product performs functions formerly requiring the use of two materials.

This product is said to withstand severe corrosive exposures and to make one-coat protection possible for chemical process equipment. For details,

CIRCLE 100 ON SERVICE CARD

Suppliers Briefs

Bemis Bro. Bag Co. F. G. Bemis of Boston was elected chairman of the board and Judson Bemis of Minneapolis president and chief executive officer. C. W. Akin becomes executive vice president; R. V. Scott and B. L. Willmore, vice presidents, and J. T. Braxtan, assistant secretary.

Bradley Pulverizer Co. has appointed Peter B. Bradley as executive vice president.

Chase Bag Co. Production facilities for converting polyethylene film to bags have been installed at the firm's New Orleans plant.

Ferro Corp. unaudited sales and earnings figures for 1959 show the firm had the best year in its history. Consolidated net income was $3,331,000, up 68 per cent from $1,986,000 in 1958; sales were $63,846,000, up 13 per cent from $56,378,000 reported in 1958.

St. Regis Paper Co. directors have declared a cash dividend of 35 cents a share on common stock payable March 1, plus an extra dividend in stock of two per cent payable April 1. Both are payable to holders of record Feb. 5.

Stedman Foundry & Machine Co. Harold R. Krueger has been named to the new position of assistant sales manager, Machinery Div.

Vulcan Steel Container Co. has named Gerry E. Cook as sales-service representative for the State of Tennessee.

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Insect investigations

Southeastern Branch, Entomological Society of America, at its January meeting reported on a variety of research projects adding to man's store of knowledge

MORE than two-hundred entomologists, workers in all phases of insect study and control, met at the DeSoto Hotel, on Jan. 25–27 in Savannah.

Insect specialists from as far west as Arkansas and Louisiana number among the more than 400 members of the Southeastern Branch. The Entomological Society of America, covering the entire nation, has over 3000 members.

Emphasis on the safe use of insecticides figured prominently in the program with a significant report by G. C. Rohwer, USDA, Winter Haven, Florida. Field studies were conducted for eight years using insecticides in granular form as a means of destroying white-fringed beetles and the Mediterranean fruit fly "without seriously affecting wildlife and domestic stock."

"Keeping the house fly under control requires constant research and education of our public", commented Carl Nettles, Leader in Extension Entomology at Clemson College, S. C.,

"Preliminary studies were conducted at Clemson College, S. C. to determine the effectiveness of various insecticides as residual sprays for the control of house flies," reported T. R. Atkins, Jr., entomologist. "Of the toxicants tested, Dimethoate applied as a 1.0 per cent spray gave good control for 10 weeks. Two per cent Korlan was effective for 6 weeks but at the 1.0 per cent concentration was ineffective after 1 week."

TEST INSECTICIDE TREATED CORDS

Tests using insecticide-treated cords were reported by Dr. E. C. Burns, Louisiana State University, to determine their effectiveness for the control of house flies infesting pig parlors in the Baton Rouge area. Cords treated with 12 per cent Korlan, 25 per cent Diazinon, or Bayer 29493 (Baytex) produced effective fly control for more than 10 weeks, according to Burns.

Research entomologists from the famous "Orlando Laboratory" of USDA such as G. C. LaBrecque, H. G. Wilson, Claude H. Schmidt, Donald E. Weidhaas, Malcom C. Bowman and M. M. Cole presented papers on the control of insects that spread diseases.

"Eradication of the boll weevil and certain other insect pests of cotton from the Southeastern States and possibly the entire cotton belt may now be within our grasp as the result of recent advances in the region-wide basic research programs", said Prof. F. E. Guyton, Branch Chairman.

These recent advances are like new planks in a platform of basic knowledge of a list of costly cotton production pests, Guyton said. "We are beginning to understand what makes a boll weevil 'tick' and when we know enough we may be able to 'wham' him like the med fly, the screw worm fly and some others have been done."

CONTROLLING FOREST INSECTS

"Scientific breakthroughs have been achieved in the control of forest insects", according to Dr. C. O. Eddy, a past Chairman of the Branch.

"Cottonwood pulp plantations can now be made to grow fast, straight and tall by using systemic insecticides", says Dr. Eddy referring to recent tests in Mississippi.

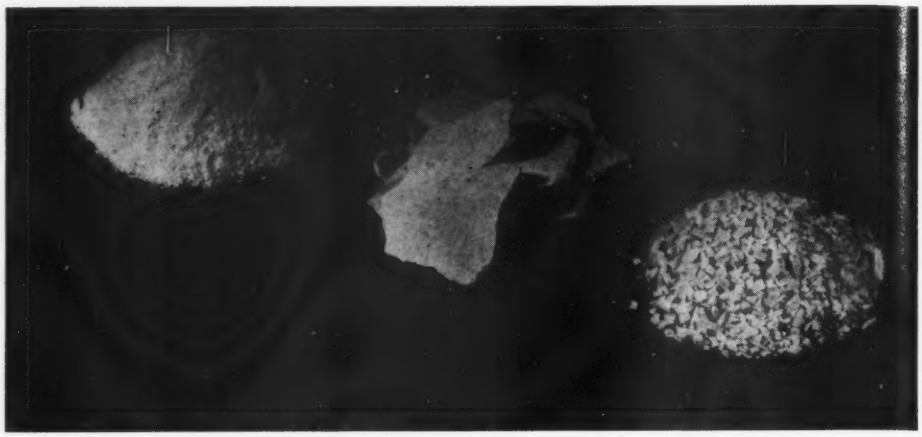
Robert Morris of the USDA at Stoneville, Miss., is studying the systemic chemicals on cottonwood. His effort is directed toward preventing stunting that results from attack of young cottonwood trees by twig boring insects. Morris found that by dipping cottonwood cuttings in a chemical known as thimet at planting time he could prevent attack of various species of insects and obtain up to 3 or 4 feet additional growth per year as compared to untreated cuttings.

"Fight insects with insects! Pit one insect against another." That is what Gene Amman, USDA Entomologist, Asheville, N. C., is doing in an effort to control balsam wooly aphid, as reported by Amman at the Branch meeting.

Mr. Amman is using natural methods to control the aphid. Last year he released about 10,000 insect predators imported from Europe to feed on the aphid. These insects eat the aphids and keep them under control in Europe and he hopes they will do the same in the Blue Ridge Mountains.

Amman plans to release and study over 50,000 specimens this year; these will include some eight different species of predators. It will take several years of study to learn whether or not the effort is successful.

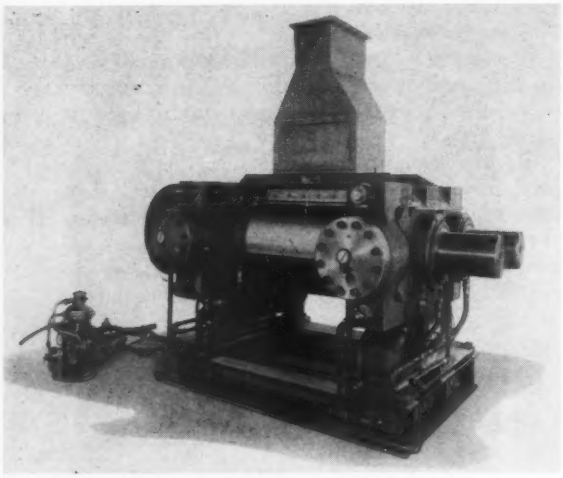
According to Herman S. Mayeux, Public Relations Chairman for the meeting and entomologist for Florida Agricultural Supply Company, Jacksonville, Fla., "We already know how to cope with insect pests well enough to produce food and fiber economically for our anticipated 200 million population. We can help our people stay healthy and comfortable. This is very satisfying to us. There is room in entomology for many more young men and women who become interested in the biological sciences." ▲



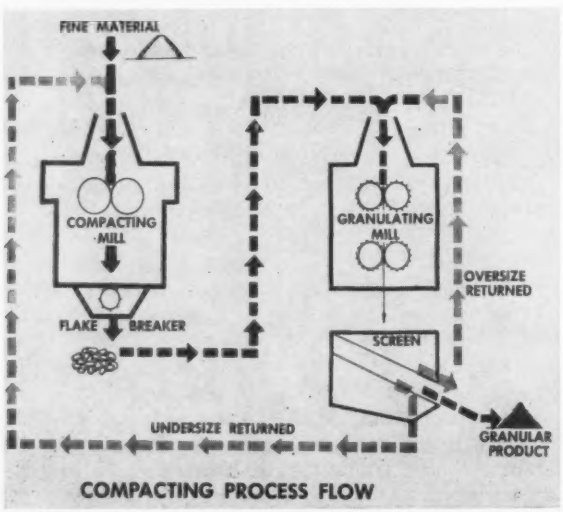
Compacted salt from fines. 1—Minus 30 mesh fines. 2—Compacted salt flakes. 3—Granules salt-screened at 10 mesh. 80% to 90% recovered as plus 10 mesh product.

Compacting fertilizer salts

Studies are underway on application of the system to blended fertilizers.



18" diameter by 24" face compacting mill, front, drive-side showing hydraulic adjusting cylinders connected to pneumatic-hydraulic power unit.



COMPACTING PROCESS FLOW

COMPACTING of fertilizer salts to upgrade and/or densify fine particle sizes is meeting with a high degree of acceptance by basic fertilizer producers according to Allis-Chalmers engineers.

In disclosing some of the operating data from potash, ammonium sulfate, di-ammonium phosphate and similar plants presently using their continuous compacting system, Allis-Chalmers also indicated that its engineers are conducting feasibility studies for the method as applied to blended fertilizer production.

Basically, the Allis-Chalmers compacting system agglomerates "fines" by passing them between smooth rolls capable of exerting pressures great enough to produce a solid ribbon for subsequent granulation to desired particle size.

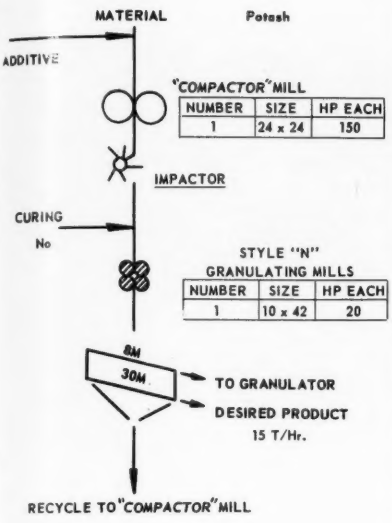
While flows may vary according to raw material feed size, preheating requirements, moisture and curing requirements, compacting process flow is most often a closed-circuit arrangement between *Compactor* mill, granulating mill and screen.

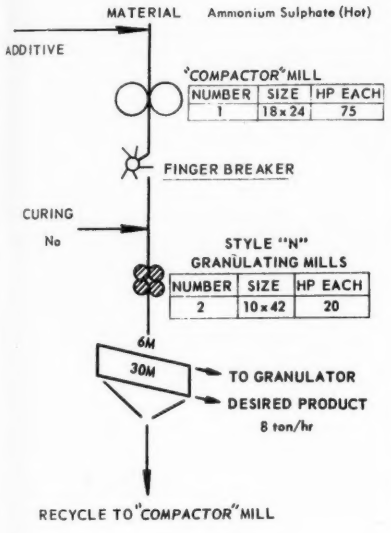
Commerical operations show the product to be readily accepted—in fact, superior to other agglomeration methods such as recrystallization, briquetting and prilling. It is free-flowing and granular with close control of product size, shape and density.

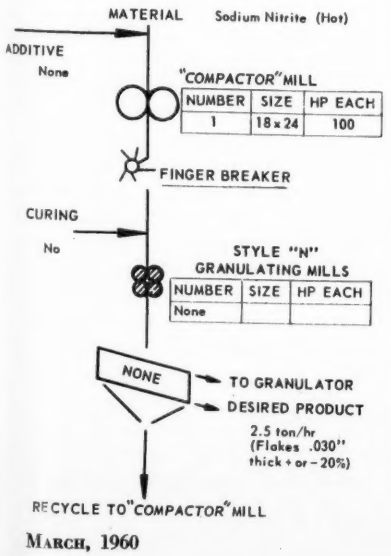
Packing of fines is eliminated at the fertilizer application stage and no segregation of fines occurs, a desirable feature for blended fertilizer producers desiring a completely homogeneous product that will not degrade or segregate by ingredient.

Capital investment is lower, and the system is more flexible, and easier to maintain and operate without highly skilled technical personnel.

Typical commercial operations range from about 2½ tph up to about 15 tph capacity depending upon feed material, machine size, and operating variables. More than 40 Allis-Chalmers units are presently compacting a variety of inorganic salts: potash, rock salt, sodium chloride, sodium nitrate, sodium nitrite, di-ammonium phosphate, ammonium sulfate and carbon. ▲







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Where trace elements are needed, FTE provides real advantages. Being *fritted,* and slowly soluble on a *controlled,* predetermined basis, FTE stays in the soil (won't leach out) and supplies needed nutrients to crops *all through* the growing season. Equally important, there are no toxicity hazards.

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The Southern Regional Liquid Fertilizer Conference, sponsored jointly by the Land Grant Colleges in the Tennessee Valley area and the Tennessee Valley Authority, was presented at Rock Eagle 4-H Club Center, Eatonton, Georgia, February 9-11.

Two of the presentations discussing the status and problems of the liquid fertilizer industry are contained in this issue of FARM CHEMICALS. *(see also page 39).*

Among the subjects covered at the conference were: Comparative Agronomic Value of Liquid and Solid Fertilizers, Methods of Application of Liquid Fertilizers, Problems in Adding Secondary and Trace Elements and Pesticides to Liquid Fertilizers, and Corrosion Problems Involved in Liquid Fertilizers.

Next month, FARM CHEMICALS *will publish a story showing how a pioneer in the liquid fertilizer field encountered and overcame the problems that are associated with liquid fertilizer production.*

THE STATUS OF LIQUID FERTILIZER

Liquid fertilizer forms establish themselves throughout the country in keeping with modern technology. Today 354 plants produce liquid mixes.

By A. V. SLACK*

THE USE OF fertilizers in liquid form is not particularly new; as far back as 1853 the use of "ammoniacal liquor" was reported in England. It is only in the past decade or so, however, that liquids have attained any prominence as compared to solid fertilizers. Liquid fertilizers have now advanced to a challenging position; for example, liquid forms of nitrogen—including anhydrous ammonia, aqua ammonia, and nitrogen solutions—accounted for about half of the total nitrogen used in direct application in 1958, even though old established fertilizers such as ammonium nitrate, ammonium sulfate, and sodium nitrate were among the solid contenders.

MIXED LIQUIDS: "A FAIRLY NEW DEPARTURE"

In the mixed fertilizer field, the liquid form is a fairly new departure. The practice began in the Far West some 30 years ago but did not amount to much until the last decade. Today liquid mixes in California account for about 26 per cent of the total mixed fertilizers used in the state. Use in states east of the Rocky Mountains was practically unknown until 1954. After the first plant was built in that year the practice mushroomed at a surprising rate. Today, only 5 years later, it is estimated that there are 256 plants in the central and eastern parts of the country. With the Far West included there are now about 354 plants producing liquid mixes.

REDUCING LABOR, HANDLING COSTS

Growing use of fertilizer in liquid form is to be expected as a development in keeping with modern technology. With any low cost chemical product used in large quantities, cost of handling is an important part of the over-all cost. Use of the liquid or slurry form is a growing practice in handling heavy chemicals to reduce labor and other handling costs. In the fertilizer field bulk handling of solutions or slurries can also simplify handling, especially in application of fertilizer on the farm.

Consumption reports show that anhydrous ammonia occupies a more important place in central and western states than it does in the East. Total consumption in 1957–58 was about 479,000 tons of nitrogen, as compared to 377,000 for ammonium nitrate, the runner up. Nitrogen solutions are more popular in the South Atlantic and West North Central States. Total consumption of nitrogen in this form was about 100,000 tons. Current annual consumption of liquid mixes is estimated at over 800,000 tons. This probably

*Tennessee Valley Authority, Wilson Dam, Alabama.

represents about 200,000 tons of plant food, or about 4.5 per cent of that applied in the form of mixed fertilizers.

Thus it is clear that liquid mixes have not made the inroads in the mixed fertilizer field that anhydrous ammonia and nitrogen solutions have in the direct application field. One reason, of course, is that liquid mixes are newer in most sections than the nitrogen liquids. A major difference, however, is that the latter usually can be produced and sold for less cost than for comparable solids. This is not the situation with liquid mixes; these normally cost as much or more to make than solid mixes, and must depend on convenience and saving in handling and application as their main advantage.

Availability of phosphoric acid during the rush production season in spring appears to be one of the major current problems in the liquid mixed fertilizer industry. Most producers have tried to keep expensive acid storage at a minimum and have depended on the acid supplier to deliver acid when needed. This worked fairly well in the beginning of the industry but as the demand for acid has grown, both for liquid and solid mixes, the supply situation during rush seasons has become critical.

Raw material cost is also a problem. The trend is to the use of urea-ammonium nitrate solution rather than urea as a means of reducing cost for supplemental nitrogen, even though the grade is usually lowered thereby. The main raw material cost problem, however, is in regard to phosphate. The lower cost of wet-process acid in most areas has led to a major effort in finding ways to use it.

IMPURITIES IN WET-PROCESS ACID

The various efforts to avoid the problem brought about by the impurities in wet-process acid can be grouped under the following headings.

1. *Purifying of acid.* The problem can be minimized by giving some attention to the purity of the acid at the producing point. Some producers now do this, either by extended settling or by chemical additions to precipitate some impurities. However, the major impurities—iron and aluminum—are not removed by these procedures.

2. *Precipitation of impurities.* The iron and aluminum precipitate upon ammoniation of the acid and can then be removed by filtering, decantation, or other separation methods. The precipitate, however, contains part of the phosphate and must be recovered and used. For a producer making only liquid mixed fertilizer this is a difficult problem. For this reason the method is more applicable to plants that also produce a solid NP or NPK fertilizer, into which the settled sludge or filter cake from the acid ammoniation step can be incorporated. This method is in use, mainly in the Pacific Northwest. There most of the liquid mixers use a base 8-24-0 solution supplied by an acid producer. Except for shipping cost, this appears to be a good way of using wet-process acid in liquid mixed fertilizers.

3. *Sequestration of impurities.* Since the producer of liquid mixes normally has no good way to handle separated impurities, he must leave them in and try to find some way to get an acceptable product. One approach is to add a sequestering agent that will prevent the impurities from precipitating when the acid is ammoniated. There are several agents which will do this but most of them are too expensive. The only one that appears promising is superphosphoric acid; the pyrophorphoric and polyphosphoric acid it contains will sequester impurities as well as supply phosphate to the solution. Work on this method is being carried out by TVA and by several producers.

4. *Suspension of impurities.* If the precipitated impurities are left in the product, they tend to settle on standing and may clog equipment. However, if the product is not stored very long before application little trouble usually is encountered. For longer storage it is desirable to use some means for delaying settling. Conditions during ammoniation affect the properties of the suspension, and a suspending agent such as a clay has been found helpful. One of the main problems is slow growth of crystals of magnesium ammonium phosphate; after several weeks of storage these often grow large enough to clog spray orifices. Experimental work on ways to prevent growth of these crystals is under way at TVA.

APPROACHES TO LOW ANALYSIS PROBLEM

A continuing problem is the relatively low analysis attainable in liquid mixes as compared to solid mixes. Progress is also being made toward solving this problem. The various approaches and the status of each are summarized as follows:

1) Use of ammonium nitrate along with urea raises the grade of some nutrient ratios. The optimum amount varies with the ratio. In many instances, however, addition of ammonium nitrate reduces solubility.

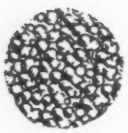
2) The NH_3:H_3PO_4 ratio has a significant effect on solubility in grades low in potash. General practice is to use a mole ratio of 1.7, whereas 1.6 or 1.5 usually gives a somewhat higher grade. A few producers are taking advantage of this.

3) Use of superphosphoric acid (76% P_2O_5) gives a large increase in solubility, especially in grades low in potash. Several producers are using superphosphoric acid this season. An 11-33-0 base solution made from superphosphoric acid is also being used to some extent in cold-mix operations.

4) For grades containing potash, solubility can be increased by using potassium hydroxide or potassium carbonate rather than potassium chloride. However, these materials are so much more costly than potassium chloride that use of them merely to increase concentration is quite limited.

5) Concentration can be increased by exceeding the solubility of the nutrient salts and treating the salted out constituents to produce a stable suspension. Salting out is then no longer a major difficulty but problems in applying the product are introduced. Very high grades can be produced in this manner but much more work is needed before the practicality of the method is established and producers can use it with any assurance of success. ▲

GRANULAR HERBICIDES



"Greatest limiting factor in the effective commercial field use of granular herbicides today is the lack of sufficient research data. The tempo of research in this field suggests that the required data will be available soon."

By L. L. DANIELSON*

INTEREST in research on granular herbicides has grown at a rapid pace in very recent years. Initially, this research was directed almost exclusively toward the solution of practical field problems. Continued experience has, however, shown the critical need for basic research in many phases of granular herbicide formulation and use. Recognition of this need has stimulated the initiation of an increasing number of studies on fundamental problems.

Applied research and commercial use of granular herbicides have moved so rapidly and with such enthusiasm that we are in need of an evaluation of the scope and progress of this work to date in order to determine our present status and chart a comprehensive and fruitful research program for the future.

LIMITATIONS OF GRANULAR HERBICIDE USE.

Comparative studies of granular and spray formulations of herbicides have shown that they may be used interchangeably for certain weed control problems. It has also been shown very clearly that each type of formulation can be used to perform certain functions in weed control that are not achievable with the other. Studies on a number of herbicides indicate that preplanting and pre-emergence applications of spray and granular formulations of certain chemicals may be equally effective and that useful information can be developed in a continuation of research on this phase. Applications of spray and granular formulations of herbicides on growing crops and weeds have shown that, in general, established weeds cannot be controlled with granular herbicides, whereas directed and overall application of sprays have proved very effective in a number of weed-crop situations.

It has been found that the physical and chemical properties of herbicides may also limit their use in granular formulations. The mode of action, solubility in suitable solvents, and the hygroscopic characteristics are some of the factors which determine the usefulness of herbicides in granular form.

The availability of suitable field application equipment has been a limiting factor until recently. Several companies are now developing and selling a number of types of equipment so that this gap between research and field use is being closed.

The greatest limiting factor in the effective commercial field use of granular herbicides today is the lack of sufficient research data. The tempo of research in this field suggests that the required data will be available soon.

PHYSICAL SELECTIVITY OF GRANULAR HERBICIDES

Experiments have shown repeatedly that a physical selectivity of practical importance can be achieved with granular formulations of some herbicides. This physical selectivity greatly reduces or eliminates permanent contact of the chemical with the leaves and stems of the crop. Comparative studies of spray and granular formulations, applied on crops following clean cultivation, have shown that a larger percentage of the active chemical reaches the soil when granular formulations are used. This has been reflected in more effective weed control under the canopy of crop foliage.

Research has also shown that the physical selectivity of granular herbicide formulations is only useful

* *Plant Physiologist, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Maryland. Presented before the Northeastern Weed Control Conference, New York City, January 6, 1960.*

in crops when it is used to enhance an inherent chemical selectivity. As an example, spray and granular applications of CIPC and EPTC are both tolerated by tomatoes at lay-by, whereas, monuron sprays cause immediate severe injury and monuron granules cause severe injury after a lapse of about 3 weeks—the time required for the chemical to enter through the roots and become systemic in its action.

The physical selectivity of some granular herbicide formulations and their convenience of application should prove of material help in broadening herbicide use. A promising future has already been indicated by the research on weed control in ornamental nurseries where granular herbicides are proving effective.

WHAT DO WE NEED TO KNOW ABOUT GRANULAR HERBICIDES?

Research on the applied phases of granular herbicide formulation and use have yielded a large amount of important and useful data that has formed the back bone for progress in this field to date. This research has also brought out the importance of strengthening the studies on the basic aspects of these problems in order to provide more complete answers.

In order to present some of the points of departure for basic research that have become apparent through the applied phases, it is convenient to consider them in 4 categories as follows: (1) Chemical, (2) Physical, (3) Biological, and (4) Environmental.

Chemical Factors. Experience has indicated that the chemical properties of the herbicides, granular carriers, solvents, surfactants, and other adjuvants have an effect on the herbicidal activity and crop selectivity of granular formulations but we have little or no specific information on the exact relationships. We might ask the following questions and indicate some of the specific areas in which research is needed:

- Do solubility and volatility of herbicides affect their activity in granular formulations?
- Is *p*H of the herbicides and carriers important?
- How important is volatility of solvents?
- Do the chemical properties of some carriers hasten breakdown of the chemical in storage or in the field?
- How do the anionic, cationic, amphoteric, or nonionic properties of surfactants affect the activity of herbicides on the various carriers?
- To what extent can surfactants affect the sphere of influence of the individual herbicide granule?

These are only a few of the questions that might be asked on the chemical aspects of granular herbicide activity. They are thought provoking and each of them could be the nucleus of a basic study of importance to our understanding of granular herbicide performance.

Physical Factors. The physical properties of granular carriers such as granule density, size, sphere of influence, structural permanence, adsorptive capacity, absorptive capacity, and color are factors which need to be thoroughly investigated to determine their effect on herbicidal activity.

A limited amount of research has been conducted on problems in this category. It has been found that the level of herbicidal activity of treated granules changes when they disintegrate when moistened. Granule size and number per unit of area treated are important in achieving effective weed control although these values do not appear to be highly critical. Preliminary data indicate that highly adsorptive carriers reduce the activity of certain herbicides. As an example, it has been found that activated charcoal adsorbs and holds measurable amounts of CIPC so tenaciously that a growth response is not obtained in a sensitive bioassay. Absorptive capacity of a granular carrier for an herbicide and its solvent determines the amount of the herbicide which can be carried by a granule without affecting flowability of the finished product and intensive research is needed in this area.

In this connection, preliminary studies have shown that relatively large amounts of CIPC can be absorbed by attapulgite granules without affecting flowability of the granules, whereas pyrophyllite granules will absorb only very small amounts of this herbicide. Very little is known about the effect of the color of granules on the rate of dissipation of an herbicide from their surface. It seems reasonable to speculate that there may be a relationship based on differential absorption of radiant energy from the sun since temperature level has been shown to be an important factor in the residual period of herbicides in general.

These fragments of information on the physical properties of granular carriers serve to emphasize the need for comprehensive studies of these factors.

Biological Factors. The biological problems involved in granular herbicide research are primarily those concerned with the morphological and anatomical characteristics of crops and weeds. The study of these factors involves the evaluation of granular formulations in relation to such conditions as upright versus procumbent or rosette growth habits, terminal versus intercalary growth patterns, flowering and fruiting stages of development versus vegetative stages, hairy versus non-hairy leaves and stems, waxy versus non-waxy plant surfaces, and smooth versus wrinkled or savoyed leaves.

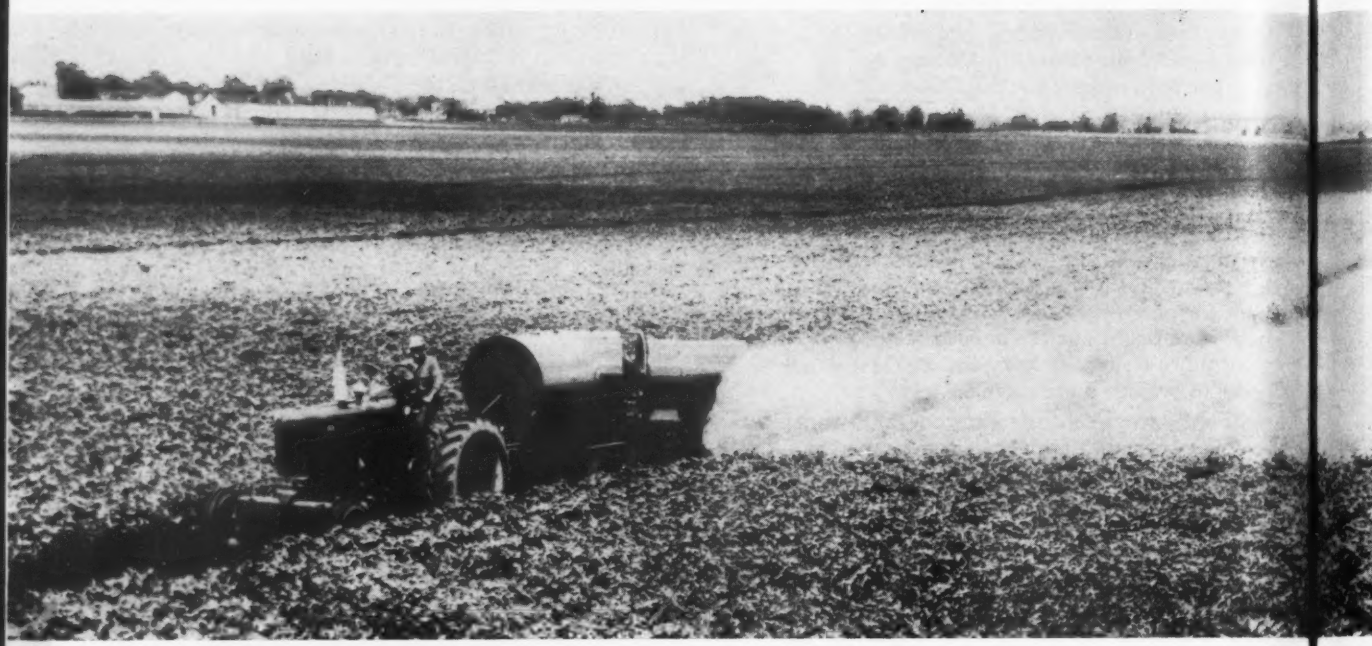
The relationship of these and other similar factors to the effective use of granular herbicides appears quite obvious at first glance but it is interesting to note that, here again, very little exact information is available on this subject.

Environmental Factors. It is impossible to effectively study any herbicide without evaluating the importance of specific environmental conditions. Important contributions can be made by critical studies of soil composition, soil moisture level, soil tilth, type of irrigation, amount and incidence of irrigation, incidence and amount of rainfall, humidity level, wind velocity, air and soil temperature, and intensity and duration of sunlight as these factors affect the results obtained with granular herbicides. Some information is available on this subject but it is evident that more comprehensive records of environmental conditions must be kept in each experiment if we are to understand and correlate results from different geographical areas.

CONCLUSION

Results to date indicate that we have made real progress in research on granular herbicides. They also indicate the need for more studies of basic problems associated with granular herbicide formulation and use. ▲

THIODAN... broadsp



A farmer sprays his potato fields with Thiodan. Among potato insects which the chemical controls are potato beetles, aphids, flea beetles; leafhoppers; potato tuberworm; southern armyworm; green stinkbug; and leaf-footed plant bug.

IN THE LATE summer of 1955, Niagara Chemical Division, Food Machinery and Chemical Corporation introduced into the United States a new pesticide, Thiodan, which is destined to become an important weapon in the growers' pest control arsenal. Thiodan is a new compound discovered in the laboratories of Farbwerke Hoechst A. G. of Western Germany. Since its introduction into the United States it has been the subject of an extensive research and development program.

From these studies it has become increasingly clear that Thiodan possesses outstanding aphicidal properties. But more than this, it has been found to possess a broad spectrum of insecticidal activity, being effective against a wide range of insects on many crops. While Thiodan should not be classed as a miticide it has also shown in numerous tests a fair measure of miticidal activity.

CHEMICAL IDENTIFICATION

Technically, Thiodan is a chlorinated, fused ring, heterocylic compound, identified chemically as 6,7,8,-9,10,10 - hexachloro - 1,5,5a,6,9,9a - hexahydro - 6,9-methano-2,4,3-benzodioxathiepin-3-oxide. For labeling and most other purposes this is shortened to hexachloro - hexahydro - methano - 2,4,3 - benzodioxathiepin oxide. Technical Thiodan contains two insecticidally active geometric isomers.

At the present time Thiodan has been federally registered for the control of several insects attacking broccoli, cabbage, cauliflower, cotton, eggplant, ornamentals, peaches, peppers, potatoes, seed alfalfa, seed clover, seed peas, strawberries, tobacco and tomatoes. Up to this time all registrations on food crops have been obtained on a "no residue" basis. That is, the material is used in such a manner or at such a time that no residue remains on the edible portions of the treated crop at harvest. It is expected, however, that tolerances on several crops will be established in the near future which will greatly expand the field of use for Thiodan.

LOW TOXICITY TO BEES

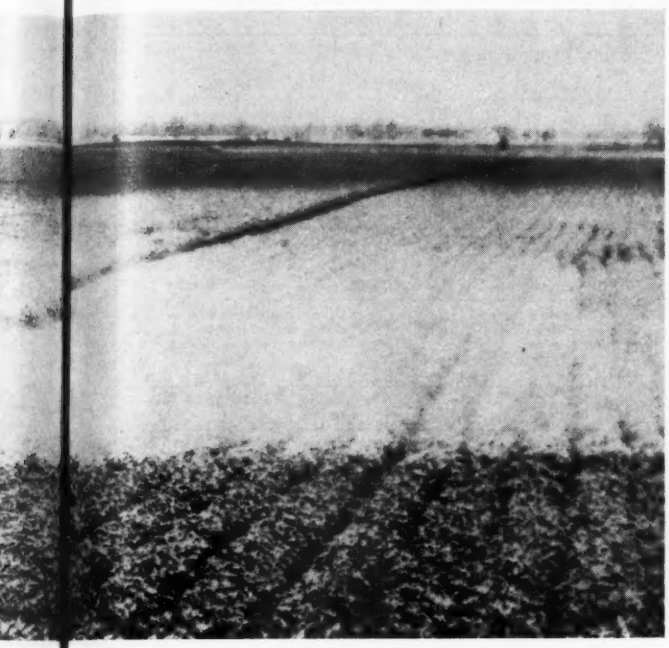
One particularly interesting feature of Thiodan is its relatively low order of toxicity to bees, a distinct advantage for any pesticide chemical.

Typical of the results which have been obtained with Thiodan, and illustrative of its broad spectrum of insecticidal activity, are those recently reported by Young and Ditman (12). In their tests Thiodan and five other pesticides were evaluated for insect and mite control on eight vegetable crops (cabbage, cantaloupe, cucumber, eggplant, lima bean, potato, snap bean and tomato).

Multiple applications, averaging 0.28 pound of Thiodan per acre, gave good control of lace bug, blister beetle, leafhopper, corn earworm, aphids, cabbage looper, Mexican bean beetle, imported cabbageworm and flea beetle. Thiodan was the only

By R. M. WILHELM, JR.*

dspectrum pesticide



material to give significant control of flea beetle. Thiodan gave a measure of control (58 per cent) of spider mites which, while it does not offer commercial control, does illustrate the fact that it possesses some miticidal activity.

WELCOMED BY POTATO GROWERS

Because of its ability to control all four of the insects of major economic importance—Colorado potato beetle, leafhopper, aphids and flea beetle—Thiodan has been enthusiastically received by potato growers. Typical performance data have been reported by Moore (6) and Hofmaster (5). In addition it has demonstrated excellent performance against armyworms, green stink bug, leaf-footed plant bug, potato tuberworm and other insects of lesser economic importance. Schopp and Landis (10) feel that the outstanding effectiveness of Thiodan against aphids on potatoes, particularly from aircraft applications, may be attributable to fumigant action.

Tobacco is another crop on which the versatility of Thiodan shows to good advantage. Thiodan is effective for the control of the five major insect pests of tobacco—hornworm, budworm, cabbage looper, aphids and flea beetle—and has been federally registered for use against these insects on all types of tobacco.

Thiodan treatments have not resulted in any adverse effects on flavor or grade of treated tobacco leaf.

On ornamentals Thiodan has proved to be an outstanding aphicide, both in the greenhouse and out-of-doors. In numerous tests in commercial greenhouses Thiodan has provided complete control of aphids for up to 90 days and, in at least one case, respraying was not necessary until 117 days after treatment. Thiodan also appears promising against Japanese beetle adults, rose chafer, cyclamen mite, chrysanthemum midge and other insects.

Of particular interest to growers of greenhouse tomatoes is the effectiveness of Thiodan against greenhouse whitefly. In recent years control of this pest with existing materials has become increasingly difficult. Neiswander (7) has found that Thiodan is extremely effective both as a spray and as a 10 per cent aerosol.

CONTROL OF CYCLAMEN MITE

Thiodan is one of the few materials offering excellent control of cyclamen mite, an important pest of strawberries. Allen, Nakakihara and Schaefers (1) have reported results which are typical of the control to be obtained. Two methods of treatment have been registered—field applications using dust, wettable powder and emulsifiable concentrates. In addition promising control of spittlebug has been reported.

Rolston and Hendrick (8) have reported on their excellent results with Thiodan for the control of cabbage insects. Comparable results have been reported from numerous other cooperators. At the present time Thiodan has been registered for use on broccoli to control cabbage looper, imported cabbageworm and diamondback moth larvae. Promising results against flea beetle and Harlequin bug have also been noted by several workers.

The outstanding effectiveness of Thiodan against aphids foretells widespread acceptance by growers of eggplants, peppers and tomatoes. Registration for these uses was recently obtained. Further interest in Thiodan has resulted from reports of aphid resistance in certain areas, particularly to some of the phosphate materials.

Against peach tree borer in the Southeast, Thiodan has given excellent results (3) and is currently registered for this use. Very promising results have also been obtained against peach twig borer.

On peas Thiodan has been very effective in controlling pea aphid and pea weevil and is currently registered for use on seed peas for control of these insects. One of the most promising areas for Thiodan is in the field of forage insect control. The generally recommended dosage for meadow spittlebug control is 0.25 pound actual Thiodan per acre, although in at least one case a dosage as low as 0.06 pound per acre has

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given excellent results, using hand spraying equipment. At dosages above 0.25 pound per acre excellent control of aphids, lygus bug and other insects is obtained. Treece (11) has reported consistently good results against spittlebug in Ohio for several years and considers Thiodan the most promising material for this use.

Timing of applications is reported to be less critical

Registered Use Recommendations for Thiodan

CROP	TO CONTROL	AMOUNT TO USE PER ACRE (UNLESS OTHERWISE INDICATED) 50% WP	2 lb. EC	3% DUST	4% DUST	1% DUST	REMARKS
Beans	Mexican bean beetle	1 lb.	1 qt.	25 to 30 lbs.			Do not apply after pods begin to form.
Broccoli Cabbage Cauliflower	Cabbage looper Imported cabbage-worm Diamond-back moth larvae	1 to 1 to ½ lbs.	1 to 1 to ½ qts.	25 lbs.			Do not apply after edible parts begin to form.
Cucumbers Melons Summer squash Winter squash	Aphids	1 lb.	1 qt.	25 to 30 lbs.			Do not apply within 14 days of harvest.
Cotton	Boll Weevil Cotton stink bugs Lygus bug Bollworm Cabbage looper		1to 2 to 1½ qts. for weevil; 2 qts for others	20 to 45 lbs. for weevil; 35 lbs. for others	15 to 35 lbs. weevil; 25 lbs. for others		Do not apply after bolls begin to open. Do not feed treated plants to meat or dairy animals.
Eggplant	Aphids	1 lb.	1 qt.	15 to 20 lbs.			Do not apply within 7 days of harvest.
Ornamentals (Greenhouse or out-of-doors)	Aphids	1 lb/100 gals water		Thorough coverage	Thorough coverage		On chrysanthemums best results will be obtained if applied before plants flower
Peaches (Southeastern States)	Peach tree borer	1 to ½ lbs./ 100 gals water					Uniformly spray all bark area from ground level to scaffold limbs. Make first application between July 10 and 15 and repeat at 3 to 4 week intervals until total of 3 applications made. Do not treat while fruits are still on tree. For varieties ripening after July 15 postpone treatment until just after harvest is completed. Do not allow animals to graze in treated orchards.
Peppers	Aphids	1 lb.	1 qt.	15 to 20 lbs.			Do not apply within 7 days of harvest.
Potatoes	Flea beetle Colorado potato beetle Leafhopper Aphids	Western areas: 1 to 2 lbs.	1 to 2 qts.	30 to 35 lbs.	20 to 30 lbs.		
		Eastern areas: 1 lb.	1 qt.				
	Southern armyworm Green stink bug Leaf-footed plant bug Potato tuberworm	1 to 2 lbs.	1 to 2 qts.	30 to 35 lbs.			
Seed Alfalfa Seed clover	Spittlebug Aphids Lygus bug	½ lb. 1 lb. 3 to 4 lbs.	1 pt. 1 qt. 3 to 4 qts.				Do not feed treated forage to dairy or meat animals. Do not use on forage to be sold commercially or shipped interstate.
Seed peas	Pea aphid Pea weevil	1 to 1 to ½ lb.	1 to 1 to ½ qts.	35 to 40 lb.	25 to 30 lbs.		Do not feed treated vines or threshings to dairy or meat animals.
Strawberries	Cyclamen mite	1 lb/100 gals water	1 qt/100 gals water			300 to 400 lbs.	If necessary add sufficient wetting agent to spray mixes to assure complete wetting of stems, foliage and crowns. In Eastern areas apply 400 gallons per acre. In Western areas apply 800 gallons per acre. Apply as pre-bloom application in spring. Repeat after harvest if necessary. Dust should be applied as crown treatment.
Strawberries (Pre-plant Dip)	Cyclamen mite		1 pt/50 gals water				Completely immerse plants before planting. Drain plants and allow to dry before planting.
Tobacco, shade (Southeastern areas)	Aphids Budworms Hornworms Cabbage looper				15 to 25 lbs.		Use special 4% shade tobacco formulations with organic fillers. Do not apply within 5 days of harvest.
Tobacco, except shade grown	Flea beetle Hornworm Budworm Green peach aphid	Seed Bed: 1 lb/100 gals water	1 qt/100 gals water	2 lb/100 sq yds	1 to ½ lb/ 100 sq yds		In seed beds apply about 6 gallons of spray per 100 square yards. Do not apply within 5 days of harvest.
		Field: 1 to 2 lb.	1 to 2 qts.	20 to 35 lbs.	15 to 25 lbs.		
Tomatoes	Aphids	1 lb	1 qt	15 to 20 lbs.			Do not apply within 7 days of harvest. When applying in greenhouse wear mask or respirator passed by U.S.D.A. for Thiodan protection.
	Whitefly		1 qt/100 gals water				

than with some other materials. Treece also reports promising results against other forage crop pests, such as aphids, leafhopper and alfalfa weevil larvae. Very promising results against the latter insect have also been reported by App (4) and others. At the present time federal registration has not been obtained for use on forage crops, although it has been obtained on seed alfalfa and seed clover for control of spittlebug, aphids and lygus bug.

On pears, peaches, almonds and berry vines Thiodan has proved very effective for control of consperse stink bug. For control of this insect applications are not made directly on the crop, but rather to the ground cover and orchard floor. Federal registration has been obtained for this use on pears, restricting the usage to the state of California. State registration has been obtained in California for this use on peaches, almonds and berry vines.

PROTECTING CUT TIMBER

Another area in which Thiodan is receiving attention is in the protection of cut green timber in forests. Allen and Rudinsky (2) and Rudinsky and Terriere (9) have demonstrated the effectiveness of Thiodan against the Douglas-fir beetle and other bark and woodboring insects. These preliminary studies indicate a possible potential use for Thiodan which will no doubt receive considerable attention in months to come.

In addition to those uses currently registered and those discussed above, Thiodan has given promising results on many other crops and pests. When toxicological and residue studies have been completed it is expected that registration will be obtained for many additional uses.

REFERENCES

1. Allen, William W., N. Nakakihara and G. A. Schaefers. 1957. The effectiveness of various pesticides against the cyclamen mite on strawberries. Jour. Econ. Ent. *50* (5): 648–652.
2. Allen, D. G. and J. A. Rudinsky. 1959. Effectiveness of Thiodan, Sevin and Lindane on insects attacking freshly cut douglas-fir logs. Jour. Econ. Ent. *52* (3): 482–484.
3. Anonymous. 1959. New chemicals: bad news for bugs. Farm Journal, *May:* 12.
4. App, B. A. 1959. Studies on the control of alfalfa weevil larvae in the east. Jour. Econ. Ent. *52* (4): 663–666.
5. Hofmaster, R. N. 1959. Potato insect investigations on the eastern shore of Virginia. Veg. Growers News *13* (9): 3.
6. Moore, Donald H. 1959. Field evaluation of Thiodan as an insecticide for potatoes. Jour. Econ. Ent. *52* (4): 564–567.
7. Neiswander, R. B. 1959. Greenhouse crops—Latest in insect control. American Vegetable Grower *7* (4): 44.
8. Rolston, L. H. and Robert Hendrick. 1959. Cabbage insects succumb to new insecticides. Ark. Farm Res. *8* (1): 7.
9. Rudinsky, J. A. and L. C. Terriere. 1959. Laboratory studies on the relative contact and residual toxicity of ten test insecticides to Dendroctonus pseudotsugae Hopk. Jour. Econ. Ent. *52* (3): 485–488.
10. Schopp, Ralph and B. J. Landis. 1959. Fumigation effect of Thiodan against the green peach aphid on potatoes. Jour. Econ. Ent. *52* (4): 781–782.
11. Treece, Robert. 1959. Spittlebugs can be controlled. Here are some timely pointers. Ohio Pesticide Institute News *12* (1): 28–30.
12. Young, John R. and L. P. Ditman. 1959. The effectiveness of some insecticides on several vegetable crops. Jour. Econ. Ent. *52* (3): 477–481. ▲

FIELD PERFORMANCE DATA

Potato Foliage Insect Control at Niagara Research Farm. 1959

Treatment	Pounds Actual per Acre	Season Average: Colorado Potato Beetle /80 Foot Row		Aphids per Leaf		Leafhopper per 40 Leaves	
		Number	% Control	Number	% Control	Number	% Control
THIODAN	.50	0	100	2.4	82	5	92
Untreated	—	370	—	13.3	—	60	—

Five applications during season.

Cabbage Insect Control at Niagara Research Farm. 1959

Treatment	Pounds Actual per Acre	Season Average: Imported Cabbageworm /40 Plants		Diamond-back Month Larvae /40 Plants	
		Number	% Control	Number	% Control
THIODAN	.75	2.4	94	0.8	96
Untreated	—	37		18	—

Treatment	Pounds Actual per Acre	Season Average: Loopers /20 Plants Numbers	% Control	Aphid Damage* Rating
THIODAN	.75	7.5	87	0.9
Untreated	—	59	—	2.9

* Rating: 1 = Trace, 5 = Severe Injury
Four applications during season.

Table 1. Fertilizers consumed as mixtures and as materials, year ended June 30, 1959, compared with consumption of previous year, by State and region[1] (Preliminary)

State and region	Mixtures	Materials[2]	Total	
			Consumption	Change from year ended June 30, 1958
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Maine	171	8	179	[3]
New Hampshire	17	4	21	1
Vermont	46	20	66	8
Massachusetts	72	18	90	3
Rhode Island	15	2	17	-1
Connecticut	55	21	76	-3
New England	376	73	449	12
New York	547	80	627	-9
New Jersey	213	26	239	23
Pennsylvania	585	74	659	17
Delaware	88	5	93	10
District of Columbia	4	1	5	1
Maryland	297	20	317	40
West Virginia	65	11	76	2
Middle Atlantic	1,799	217	2,016	84
Virginia	685	111	796	90
North Carolina	1,367	387	1,754	243
South Carolina	640	251	891	158
Georgia	1,151	317	1,468	210
Florida	1,293	172	1,465	4
South Atlantic	5,136	1,238	6,374	705
Ohio	977	113	1,090	36
Indiana	917	256	1,173	91
Illinois	618	924	1,542	89
Michigan	648	86	734	85
Wisconsin	416	58	474	34
East North Central	3,576	1,437	5,013	335
Minnesota	389	153	542	99
Iowa	434	261	695	153
Missouri	531	402	933	177
North Dakota	39	92	131	24
South Dakota	13	27	40	5
Nebraska	43	259	302	70
Kansas	94	196	290	93
West North Central	1,543	1,390	2,933	621
Kentucky	477	107	584	52
Tennessee	464	128	592	78
Alabama	802	275	1,077	130
Mississippi	309	382	691	59
East South Central	2,052	892	2,944	319
Arkansas	163	190	353	62
Louisiana	160	130	290	13
Oklahoma	71	63	134	27
Texas	291	374	665	-2
West South Central	685	757	1,442	100
Montana	4	38	42	3
Idaho	13	110	123	15
Wyoming	2	14	16	3
Colorado	14	72	86	4
New Mexico	5	38	43	3
Arizona	28	165	193	-16
Utah	5	42	47	7
Nevada	2	4	5	-15
Mountain	73	483	556	5
Washington	47	195	242	-5
Oregon	33	168	201	8
California	335	[4] 2,255	2,590	416
Pacific	415	2,618	3,033	419
Total	15,655	9,105	24,760	2,600
Hawaii	54	84	138	16
Puerto Rico	212	33	245	11
United States: 1958-59	15,921	[5] 9,222	25,143	2,627
1957-58	14,353	[5] 8,163	22,516	0
1956-57	14,703	[5] 8,006	22,709	193

[1] Due to rounding, column or cross totals may not balance.
[2] Includes: ground phosphate rock and colloidal phosphate, basic slag, secondary and trace nutrient materials, as borax, metallic salts, sulfur, gypsum, etc. used as separate materials. Does not include liming materials or the quantity of materials used in manufacture of commercial mixtures.
[3] Less than 500 tons.
[4] Includes an estimated 270,000 tons of dried manures.
[5] Includes materials not guaranteed to contain N, P_2O_5 or K_2O, amounting to 1,214,000 tons in 1958–59, 939,728 tons in 1957–58, and 943,243 tons in 1956–57.

Table 2. Principal grades of mixtures consumed in U. S., year ended June 30, 1959[1] (Preliminary)

Grade	Consumption	Grade	Consumption	Grade	Consumption	Grade	Consumption
	1,000 tons		1,000 tons		1,000 tons		1,000 tons
0-10-20	89	4-8-10	83	5-20-20	980	8-12-12	72
0-14-14	199	4-8-12	145	6-4-8	64	8-16-16	199
0-20-20	284	4-9-3	52	6-6-6	90	8-24-8	53
2-12-12	302	4-10-6	121	6-8-6	104	8-32-0	60
3-9-9	461	4-10-7	306	6-8-8	253	10-6-4	78
3-9-18	85	4-12-8	102	6-10-4	87	10-10-10	748
3-9-27	59	4-12-12	1,228	6-12-6	67	10-20-10	212
3-12-6	71	4-16-16	448	6-12-12	478	12-12-12	889
3-12-12	615	5-10-5	450	6-24-12	222	14-0-14	63
4-7-5	92	5-10-10	1,624	6-24-24	162	14-4-10	70
4-8-6	62	5-10-15	340	8-4-8	53	Other[2]	3,286
4-8-8	93	5-20-10	106	8-8-8	214	Total	15,921

1/ Grades consumed in amounts of 50,000 tons or more.

2/ Approximately 1,650 grades.

Preliminary Report:

Consumption of

By WALTER SCHOLL
MARION M. DAVIS
ESTHER I. FOX
CAROLINE A. WILKER

A SUBSTANTIAL increase in the quantity of primary plant nutrients, as well as the quantity of fertilizer carriers consumed, over previous years was recorded in the United States during the year ended June 30, 1959. This relatively higher change in the pattern of consumption was related to the increased acreage of certain crops and state soil fertility programs.

The data are based on shipments of manufacturers, liquid nitrogen applicators, and state tonnage reports. Estimates of the nutrient contents are determined from average analyses of samples of products as reported by State fertilizer control officials. Data for Alaska and possessions of the United States were not available. Estimates from various sources indicate that their combined consumption is probably less than 8,000 tons which is not included in these totals.

FERTILIZER

Consumption of fertilizer in the United States for the year ended June 30, 1959 increased substantially over the previous year (table 1). Total consumption was 25,143,000 tons—an increase of 2,627,000 tons (11.7 per cent). It increased in all but seven states. In these, representing 1,827,000 tons or 7.3 per cent of the total consumed in the United States, consumption was 49,000 tons below that of the previous year. Increases registered in the South Atlantic region were 705,000 tons (12.4 per cent); in the West North Central region, 621,000 tons (26.9 per cent); and in the Pacific region, 419,000 tons (16.0 per cent). Substantially more fertilizer was also used in the East North Central and East South Central regions. More than one-half of the increase in consumption of fertilizer in the Pacific region was in the secondary and trace nutrient materials, principally gypsum. The total use of fertilizer in the South Atlantic and South Central regions which has steadily decreased since the peak consumption of 11,058,695 tons in 1951–52 consumed nearly that amount in this period.

MIXTURES

Mixed fertilizers comprised 63.3 per cent of the total tonnage of fertilizer consumed and amounted to 15,921,000 tons—an increase of 1,568,000 tons (10.9 per cent). This is the first year since 1952–53 that mixtures have shown an increase and the total establishes a new peak in

* *Fertilizer Investigations Research Branch, Soil and Water Conservation Research Division, Agricultural Research Service, U. S. Department of Agriculture, Beltsville, Maryland.*

# of Commercial Fertilizers and Primary Plant Nutrients

in the United States, year ended June 30, 1959

consumption. Regions in which the principal increases occurred followed closely those regions having corresponding changes in consumption of all fertilizers.

There were 46 grades consumed in amounts of 50,000 tons or more, totaling 12,635,000 tons—accounting for nearly 80 per cent of the tonnage of mixed fertilizers consumed and approximately 1,650 other grades accounting for the remaining 20 per cent in 1958–59. The 46 grades are listed in table 2. While consumption of most of the 46 grades increased, six grades—4-12-12, 5-10-10, 5-10-15, 5-20-20, 6-12-12, 12-12-12—represented nearly 60 per cent of the total increase in consumption of mixed fertilizers. These are the grades generally consumed in largest tonnages throughout the central and southeastern States.

MATERIALS

The consumption of direct application materials amounted to 9,222,000 tons comprising 36.7 per cent of all fertilizers consumed in the year ended June 30, 1959. Included in this tonnage are 7,996,000 tons of products containing one or more of the primary plant nutrients, 1,214,000 tons of products containing only secondary and trace nutrients, and 12,000 tons of products not classified (table 3). The consumption of materials containing primary nutrients increased 785,000 tons (10.9 per cent) and secondary and trace nutrient materials 274,000 tons (29.2 per cent) from the respective quantities in 1957–58. The change in consumption of direct application materials corresponded closely with the change in consumption of mixed fertilizers in most all of the regions.

More than 73 per cent of the increase in consumption of the primary nutrient materials was in the class of chemical nitrogen materials. Consumption of this class was 576,000 tons (14.8 per cent) more than in 1957–58. Increases in the other classes of materials were 144,000 tons (6.0 per cent) for phosphates, 40,000 tons (8.9 per cent) for potash, and 13,000 tons (2.7 per cent) for the natural organics.

PRIMARY PLANT NUTRIENTS

During the year ended June 30, 1959, fertilizers used in the United States contained 7,396,000 tons of primary plant nutrients (N, available P_2O_5, K_2O) (table 4). This represented a substantial increase in primary nutrients (884,000 tons, 13.6 per cent) from that consumed in the preceding year. Consumption of nitrogen was 2,643,000 tons, an increase of 359,000 tons (15.7 per cent); that of available P_2O_5, 2,576,000 tons—283,000 tons (12.3 per cent) more; and that of K_2O, 2,177,000 tons—242,000 tons (12.5 per cent) above their amounts in 1957–58. Consumption of these nutrients increased substantially over any previous year and reflects the removal of acreage allotments as well as soil fertility programs.

Primary nutrients in mixed fertilizers represented: 37.3 per cent of the nitrogen, 78.8 per cent of the available P_2O_5, and 87.4 per cent of the K_2O. Mixed fertilizers were accountable for 36.8, 82.3, and 90.1 per cent of the increases in consumption of these nutrients, respectively. The larger use of the six grades previously listed supplied approximately one-half of the increase in tonnages of these nutrients.

The weighted average of primary nutrients contained in mixed fertilizers continued its upward trend. These averages were for nitrogen, 6.20 per cent; for available P_2O_5, 12.76 per cent; for K_2O, 11.94 per cent; and for the total of these nutrients, 30.90 per cent. The

Table 3. Kinds of fertilizers consumed, year ended June 30, 1959, by region in 1,000 tons.[1] (Preliminary)

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii Puerto Rico	Total	
											Consumption	Change from year ended June 30, 1958
MIXTURES	376	1,799	5,136	3,576	1,543	2,052	685	73	415	266	15,921	1,568
CHEMICAL NITROGEN MATERIALS	12	76	879	480	681	571	473	249	947	83	4,453	576
Ammonia, anhydrous	0	3	29	80	170	61	146	45	140	1	676	93
Ammonia, aqua	2/	2/	0	7	1	2/	7	25	359	49	448	83
Ammonium nitrate[3]	5	30	164	160	332	290	122	77	94	0	1,273	156
Ammonium nitrate-limestone mixtures	2/	2	252	2/	2/	38	3	3	2/	0	299	35
Ammonium sulfate	2/	9	7	117	14	14	82	58	228	27	557	-20
Nitrogen solutions	1	6	151	93	158	15	25	10	60	0	518	194
Sodium nitrate	2	11	250	1	2/	145	57	2/	2/	2/	467	31
Urea	2	5	3	17	5	1	23	18	28	6	107	9
Other[4]	1	10	23	5	1	7	9	13	38	2/	108	-5
NATURAL ORGANIC MATERIALS	27	40	32	46	17	2	7	7	329	2/	507	13
Dried manures	9	13	6	6	4	1	3	2	272	2/	316	15
Sewage sludge, all	6	17	9	29	7	1	2	4	49	2/	124	-10
Tankage, all	3	8	6	1	2/	2/	0	2/	1	2/	19	1
Other[4]	9	2	11	10	6	2/	2	1	7	0	48	7
PHOSPHATE MATERIALS	32	86	126	698	630	251	234	196	278	17	2,548	144
Ammonium phosphate[5]	2/	1	1	21	183	3	106	86	144	2	547	78
Basic slag	0	0	21	0	0	117	2	0	0	0	140	-5
Calcium metaphosphate	0	1	3	6	23	16	2/	2/	2/	0	49	3
Phosphate rock & colloidal phosphate	2/	7	18	529	238	17	20	2/	2	4	835	-17
Superphosphate: 22% and under	29	71	76	50	46	87	61	16	89	5	531	53
" Over 22%	2/	2	5	90	140	11	42	86	28	4	408	34
Other[4]	2	4	3	2	2/	2/	3	8	15	2/	39	-2
POTASH MATERIALS	3	9	85	207	52	64	39	3	14	13	488	40
Potassium chloride	2	7	40	203	51	48	37	2	7	11	407	42
Other[4]	1	2	45	4	1	16	2	1	7	2	81	-2
PRIMARY NUTRIENT FERTILIZERS	449	2,009	6,258	5,007	2,923	2,940	1,439	528	1,983	380	23,917	2,353
SECONDARY & TRACE NUTRIENT MATERIALS	2/	4	116	4	3	4	3	28	1,050	3	1,214	274
Gypsum	2/	3	114	1	2/	3	2/	22	1,005	0	1,148	259
Other[4]	2/	1	2	3	2	1	3	6	45	3	66	15
NOT CLASSIFIED	0	3	0	2	7	0	0	0	0	0	12	---
ALL FERTILIZERS	449	2,016	6,374	5,013	2,933	2,944	1,442	556	3,033	383	25,143	2,627

[1] States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals. [2] Less than 500 tons. [3] Undetermined quantities may have been used for non-fertilizer purposes. [4] Includes quantities undesignated by kind. [5] Includes all reported quantities of grade: 11-48, 11-50, 13-39, 16-20, 20-52, 21-53 and 27-14.

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FERTILIZER CONSUMPTION

(Continued from page 69)

corresponding values in the preceding year were 5.96, 12.53, 11.73, and 30.22 per cent.

Materials consumed for direct application represented 62.7 per cent of the nitrogen, 21.2 per cent of the available P_2O_5, and 12.6 per cent of the K_2O. Increases in consumption of these nutrients accountable to materials were, respectively: 63.2, 17.7, and 9.9 per cent. The combined increase in consumption of anhydrous ammonia, nitrogen solutions, and ammonium nitrate represented more than 80 per cent of the increase in nitrogen consumed as direct application materials. In the phosphate materials, the increase in consumption of the ammonium phosphates and superphosphates accounted for practically all of the increase in available P_2O_5, and that of K_2O in the increase in use of potassium chloride.

Increases in primary nutrients accountable to both classes of fertilizers (mixtures and materials) were proportionate to their respective contents reflecting a general increase in consumption of all primary nutrients. The proportionate increase in consumption of primary nutrients in 1959 compared with 1958 was highest in those areas in which increases in planted acreage of cotton and corn was highest (West North Central) and lowest in those areas in which there was little change in planted acreage (New England). ▲

Table 4.—Primary plant nutrients consumed in regions and United States as mixtures and as direct-application materials, by kinds, year ended June 30, 1959, in 1,000 tons[1] (Preliminary)

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii and Puerto Rico	United States
Nitrogen											
MIXTURES	29	105	251	228	129	101	56	10	45	33	987
MATERIALS	5	26	220	190	343	189	226	108	389	20	1,956
Ammonia, anhydrous	0	3	24	66	140	50	120	37	115	1	555
Ammonia, aqua	2/---	---	0	2	---	---	1	5	71	10	90
Ammonium nitrate	2	10	55	54	112	99	41	26	32	0	430
Ammonium nitrate-limestone mixtures	---	---	52	---	---	8	1	1	---	0	62
Ammonium sulfate	---	2	2	24	3	5	17	12	48	6	117
Calcium cyanamide	---	2	2	---	---	2	2	---	2	0	9
Natural organics	1	2	2	2	1	---	---	---	5	---	14
Nitrogen solutions	---	5	38	31	57	4	8	3	14	0	157
Phosphate products	---	---	---	3	27	1	15	14	24	1	85
Potassium products	---	---	2	---	---	---	---	---	0	---	2
Sodium nitrate	---	2	40	---	---	23	9	---	---	---	75
Urea	---	2	1	8	2	1	10	8	13	3	49
Other chemical nitrogen products	---	1	2	1	---	---	---	2	5	---	11
Total nitrogen	34	131	471	418	472	290	282	118	374	53	2,944
Available P_2O_5											
MIXTURES	44	214	481	580	290	233	111	13	47	19	2,031
MATERIALS	7	18	23	84	155	45	61	72	76	1	543
Ammonium phosphates	---	1	---	10	60	1	27	25	35	2	190
Basic slag	0	0	2	0	0	10	---	0	0	0	12
Calcium metaphosphate	0	---	2	4	14	10	---	---	---	0	30
Natural organics	1	1	1	1	1	---	---	---	6	---	11
Phosphate rock and colloidal phosphate2/	---	---	1	19	7	---	1	---	---	---	28
Superphosphate: 22% and under	6	15	15	10	9	17	13	3	17	1	105
over 22%	---	1	3	42	65	5	19	37	12	2	187
Other phosphate products	1	1	1	---	---	---	1	5	5	---	16
Total available P_2O_5	51	232	504	664	447	278	172	85	123	20	2,576
K_2O											
MIXTURES	46	196	554	546	194	227	73	3	30	33	1,902
MATERIALS	2	5	31	126	31	33	24	2	15	7	275
Natural organics	---	---	---	1	---	---	---	---	8	---	10
Potassium chloride	1	4	24	124	31	29	22	1	4	7	247
Other potassium products	---	1	7	1	---	4	1	---	3	1	17
Total K_2O	48	201	585	672	225	260	96	5	45	40	2,177
GRAND TOTAL: N, avail. P_2O_5, K_2O											
1958-59	133	564	1,560	1,754	1,144	828	550	208	542	113	7,396
1957-58	129	539	1,366	1,569	886	726	497	196	501	103	6,912
1956-57	125	536	1,386	1,495	819	786	477	163	452	138	6,377

1/ States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals.
2/ Dashes (---) represent quantities less than 500 tons.
3/ Represents 2 percent of the colloidal phosphate and 3 percent of the phosphate rock.

EDITORIAL

FC

Prescription for profit-less merchandising

To a stranger viewing the fertilizer industry for the first time it must seem strange to read that fertilizer consumption rose almost 12 per cent in 1958–59 over the previous 12-month period—yet the industry's *return on investment* continues to be far below that of other manufacturing industries.

According to a Bohlen and Beal study made for the TVA (See last month's "What Makes a Dealer Successful?"), dealers moan that fertilizer is too much bother . . . profits are too low . . . there's too much competition . . . farmers lack knowledge of fertilizer and its use . . . there are too many credit problems . . . and on and on!

But what a salesman for a corrugated box manufacturer or some other long established, highly competitive business wouldn't give for the "line" a fertilizer dealer has at his command . . . *like this one:*

"Each unit of farm output today will buy 2.6 times more plant food than in 1939. *Representatives of no other commodity can make that statement.*"

Who's at fault?

Well, sometimes an old problem like this one needs a little *different approach,* so we're doing something unusual on this page this month.

Just in case you didn't notice it in our *Letters* section, here's a little verse from R. L. Luckhardt of Collier Carbon and Chemical Corporation, Los Angeles. We think it sums up the situation pretty well.

Consider the Farmer in the Field
He toils now and swims
In his sweat from the noon day sun.
He neither makes the weather
Nor the prices for his crops.

The 60's are said to be his lean years
With less cash for his supplies.
The Isaiahs in their offices
Read the handwriting on their wall charts
Then tell us the happy sales spiral
Has fallen flat upon its 60's.

But as crickets multiply in the fence row
So do his suppliers of ammonia.
With more millions for machinery
to squirt out the plant food
More men will beat his bushes
for the fewer, poorer prospects.

Consider then the Farmer in the Field
Less credit to his name
More men from whom to buy
He casts his favors where he may
But will he buy from you?

According to Farm Chemicals
(whose issue I've just read)
If your merchandising's modern
In the 60's up ahead
Then you've got a chance of selling
This Farmer in the Field
And continuing your contributions to
your social security.

More companies selling the same type of products to fewer farmers! Well, there's one thing for sure, Mr. Luckhardt; the *fracturing* 60's will really separate the men from the boys—fast! Your last paragraph is the key to survival.

A great many progressive thinkers like yourself are adopting FARM CHEMICALS as their medium (and not just as an outlet for their urge to contribute verse!) for the 60's. In that regard, we'd like to contribute a few lines of our own:

Breathes there a boss with soul so dead
Who to his sales manager has never said:
Consumption is UP—profits are down,
Read the new *FC—and get us out of the red!*

Why should our new editorial format inspire such "verse"? Mainly, because hot on the heels of the ideas we present come *regular requests* from companies for reprints of our marketing articles. These, we are told, are being used as *sales training aids.*

These companies realize that the heydey of laissez faire—the Golden Age of Production—is over! They know that pre-occupation with just making a better product—and depending on government agencies to sell the product for them—is a form of Russian roulette.

Bohlen and Beal's survey of dealers says it:

Only 9 per cent of the dealers volunteered any "specific suggestions for *product improvement*—but 26% thought the supplier should provide more help in keeping up-to-date on product changes and changes in fertilizer recommendations."

The Iowa State University experts continued:

"The day of the price detective "order taker" salesman is passing out of the picture. The alternative may be the well trained specialist who can give expert advice on business and *farm management and sales and educational programs—as well as fertilizer and fertilizer use.*"

These are the problems—and the opportunities—for the 60's. Any more verse, anyone?

GORDON L. BERG

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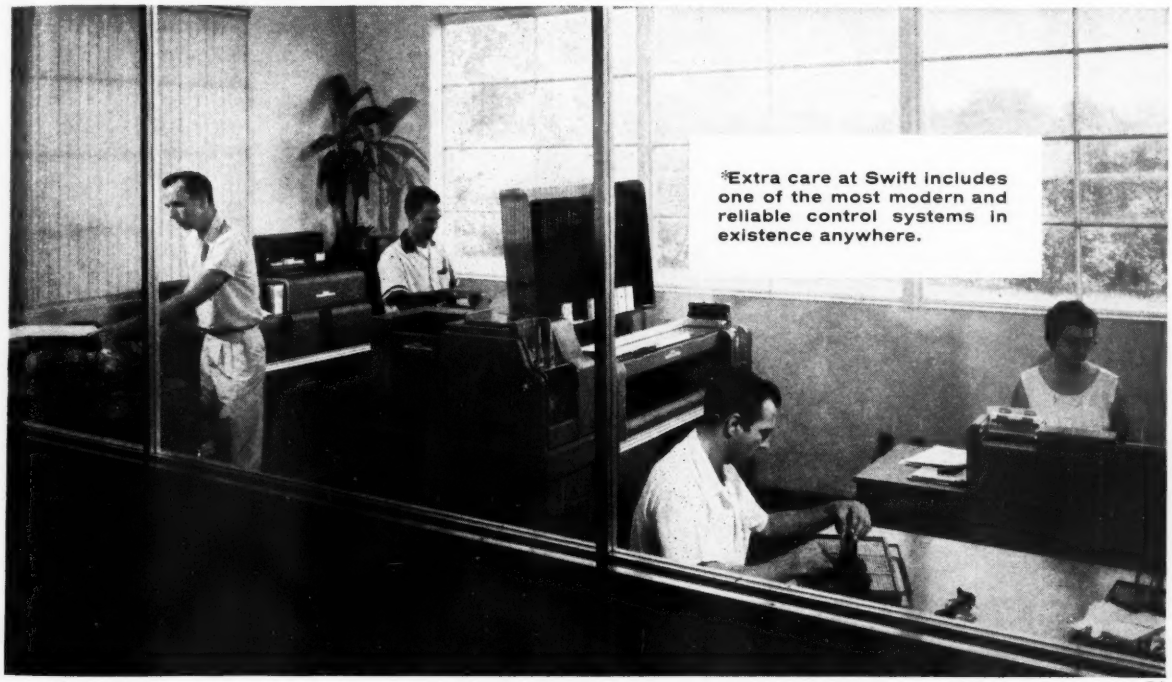
SWIFT'S PHOSPHATES



*Extra care at Swift includes one of the most modern and reliable control systems in existence anywhere.

Swift's *extra care* is just as real as is the staff that provides it. Take Customer Service, for example. This is the department to call when you want information on cars shipped, car numbers, dates and routing. With the support of a modern, precise control system you get accurate up-to-the-minute information promptly. And this is just one part of the whole Swift organization dedicated to providing better phosphate service.

Swift's extra care can help you even better satisfy your customers . . . your plant operations . . . and your profits. It's worth checking! Have a Swift Phosphate Center Representative outline the advantages Swift offers you in phosphates—Triple, rock or ground rock.

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